

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



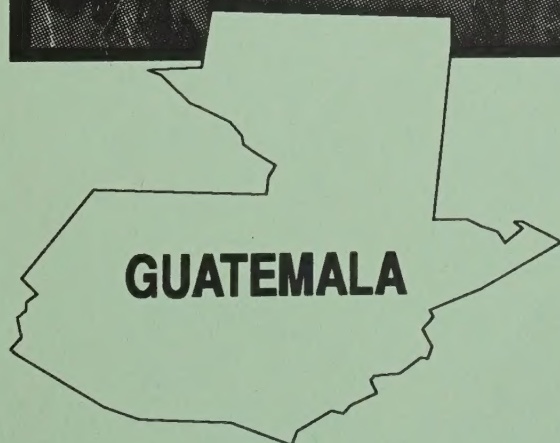
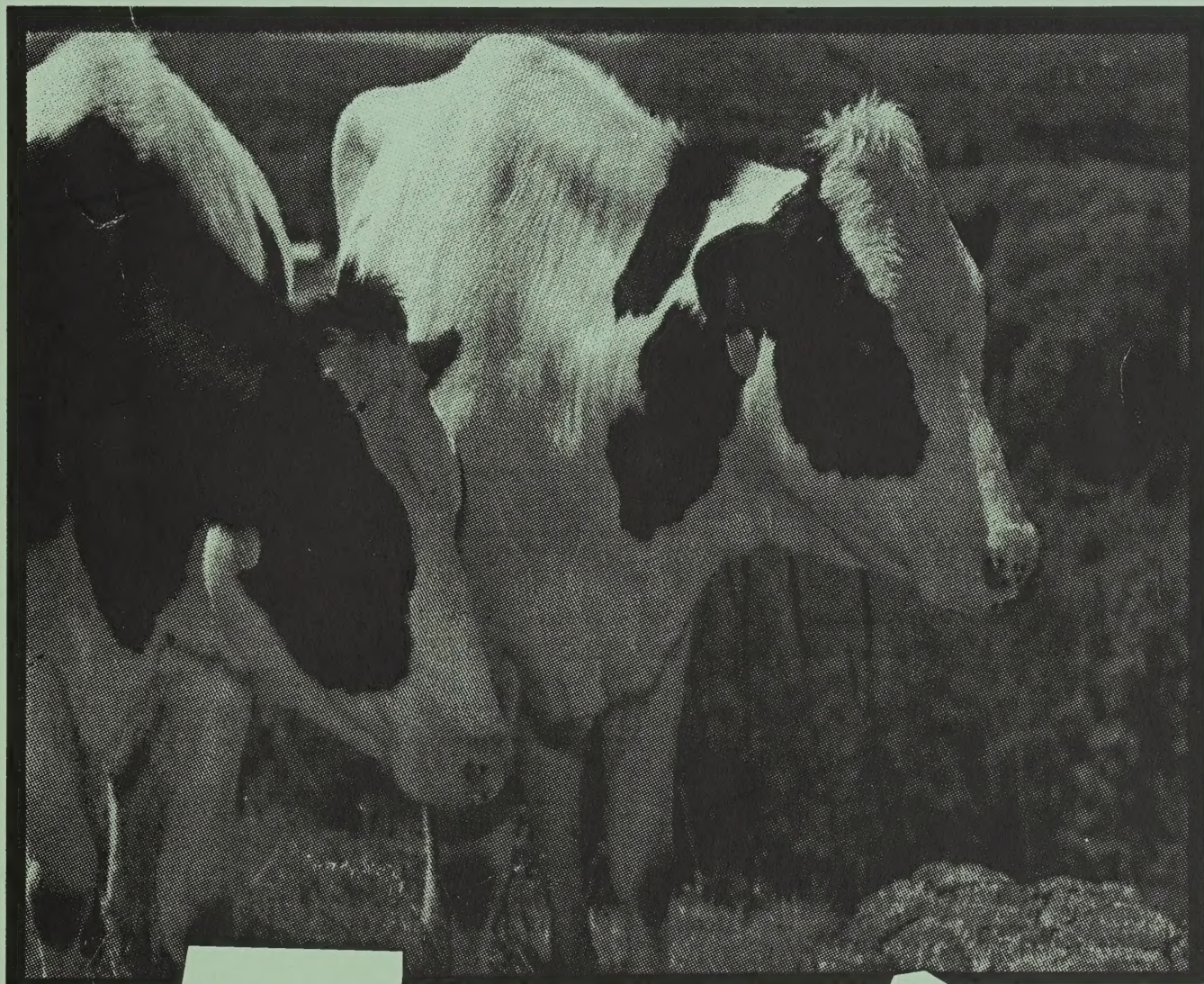


Reserve  
aSF239  
.D34  
1996

# **DAIRY INDUSTRY ASSESSMENT**

**in**

## **GUATEMALA AND EL SALVADOR**



**JULY 1996**



**United States  
Department of  
Agriculture**



**National Agricultural Library**

DAIRY INDUSTRY ASSESSMENT IN

GUATEMALA AND EL SALVADOR

July 1996

This report was prepared by **Michael Young**, partner/owner of Modern Markets, Inc. an international dairy industry consulting firm, **Wayne G. Geilman, Ph.D.**, dairy processing and manufacturing consultant, **Jennifer A. Thomas**, international marketing consultant and area manager for Latin American and Europe for the Wisconsin Department of Agriculture and **Randy W. Kortus**, owner of the top ranked dairy herd in the state of Washington. This study was funded by the Emerging Democracies Program of the U.S. Department of Agriculture's Foreign Agricultural Service (FAS) and administered by International Cooperation and Development (ICD), Food Industries Division, Trade and Investment Program within FAS. The assistance and guidance of the FAS staff in the preparation and briefing for the assessment trip and in the preparation of the final report is appreciated and acknowledged including: Richard T. Drennan and Victor Aguilar U.S. Embassy, Guatemala; Miguel Fabio Herrera, U.S. Embassy, El Salvador; Richard Rortvedt, ICD/FID and Marcus Martin, ICD/FID student intern.

For further information contact:

U.S. Department of Agriculture, Foreign Agricultural Service  
International Cooperation and Development  
Food Industries Division, Trade and Investment Program  
Room 3250 South Building  
Washington, D.C. 20205-1093

Tel. (202) 690-3985

Fax (202) 690-3982

This material was prepared for limited distribution outside of the U.S. Department of Agriculture. The views expressed herein are not necessarily those of the Foreign Agricultural Service of the U.S. Department of Agriculture.





TEAM MEMBERS' BIOGRAPHICAL DATA

**Michael W. Young, Team Leader**

Partner-owner of his own dairy consulting firm, he has focused mainly in international agriculture working extensively in Latin and South America and Southeast Asia. He has been Executive Secretary for the Brown Swiss Cattle Breeders' Association of America where he invigorated international markets for U.S. bred cattle. Widely known in the dairy industry, he has been involved with marketing U.S. genetics into 50 countries. As Sales and Marketing Director for a DNA diagnostic and embryo technology development company he was instrumental in bring DNA diagnostic services to the cattle industry worldwide.

Young has a successful background in advertising and marketing having been national sales manager for *Holstein World* and was a primary force in the formation of *Lechero Latino*, a dairy publication for the Spanish speaking world. He is a breeder of registered Holsteins and an international judge of several breeds of cattle.

**Wayne G. Geilman, Ph.D.**

A leading expert in the field of dairy product processing and food technologies. He has been a food product researcher for major food companies such as Kraft and Ridgeview Foods. He has worked in the development of new products and the enhancement of traditional products. He is a specialist in ingredient functionality and fully experienced in quality assurance programs. Geilman has worked in research and instruction at the university level and has presented numerous papers to the Institute of Food Technologists, American Dairy Science Association and the American Cultured Dairy Products Institute.

His experience as a milk processing plant supervisor coupled with his research and product development experience has made him invaluable to several new cheese processing companies in the U.S. and in Mexico. He is requested for his expertise in trouble shooting problems in the processing of all dairy products. His practical and technical expertise have made him a regular consultant for large and small operations alike. He is fluent in Spanish.







**Jennifer A. Thomas**

As the area manager for Latin American and Europe she works as an international consultant for the Wisconsin Department of Agriculture. Her experience has assisted numerous commodity and brand name products suppliers to establish international buyers. Jennifer routinely works in product promotion at international trade shows, building and qualifying contacts for U.S. suppliers. Her experience enables her to identify viable markets, products that fit the niche of the markets and the correct approach for the supplier to succeed in a specific market.

The Wisconsin Department of Agriculture is active in hosting groups or organizations coming to the state to visit production facilities, inspect new products and develop relationships with potential suppliers. Ms. Thomas is instrumental in the planning and implementation of training and information seminars including the international activities at the World Dairy Expo.

**Randy W. Kortus**

Mainstream Holsteins, operated by Kortus and his wife Jana, is a family farm consisting of 150 head of registered Holsteins, nine Jerseys and interest in the three time national Grand Champion Guernsey cow. The herd is intensely managed on 40 acres using pasture, corn silage, purchased hay and grain. Mainstream is a perennial production leader ranking first in Washington and in the top ten in the United States for production average. They bred and developed the first cow in the world to make consecutive records in excess of 50,000 lbs. of milk (5814 gallons!) in a year.

The family run farm has marketed bulls, females and embryos in eight countries and throughout the U.S., including 30 bulls entering service for artificial insemination companies. Annually the farm generates 35 - 40% of the total farm income from seedstock sales. Kortus is a Vice President of All West/Select Sires and a member of the Board of Directors and Holstein Sire Committee at Select Sires, the largest member cooperative in the industry. He also has been successful as a sale manager for the Whatcom County Sale for 10 years.





## TABLE OF CONTENTS

Team Members' Biographical Data	2
I. Introduction	5
II. Executive Summary - Guatemala	6
III. Executive Summary - El Salvador	11
IV. Guatemala Overview	
A. Dairy Genetics	15
B. Dairy Production	21
C. Dairy Processing	24
D. Dairy Marketing	26
V. Conclusions - Guatemala	33
VI. Recommendations - Guatemala	35
VII. Key Contacts in Guatemala	37
VIII. El Salvador Overview	
A. Dairy Genetics	41
B. Dairy Production	45
C. Dairy Processing	49
D. Dairy Marketing	51
IX. Conclusions - El Salvador	53
X. Recommendations - El Salvador	54
XI. Key Contacts in El Salvador	56
XII. Appendix	59
Business Cards	
El Salvador Food Importers List	

## I. INTRODUCTION

The mission of our assessment team was to travel throughout Guatemala and El Salvador learning about the dairy industry from four points of view: 1.) dairy genetics, 2.) on farm milk production, 3.) processing and manufacturing and 4.) product marketing. One team member was selected with major responsibility for each area, although the entire team had input and critical observations in multiple areas.

The purpose of the assessment was to get to understand the intricacies of the total dairy industry and to project where and how U.S. companies and products may play a role in the growth of the market. Recent statistics revealed that U.S. exports to these countries' dairy sectors had remained level or decreased, often to the benefit of other countries' exports.

Guatemala and El Salvador were prime candidates for this investigation, promoted by the U.S. officials in the FAS offices. Recent returns to stable governments after years of internal conflict and war had laid the foundation for rapidly growing economies driven by basic industries and rebuilding of the infrastructure. As both countries remain highly agricultural in nature, economic opportunity and increased consumption of dairy products seems a natural course of development.

In Guatemala 25% of all exports come from the agriculture sector. None of the \$1.4 billion total is dairy products. Over half of the total comes from coffee, sugar and bananas. The U.S. buys 38% of their total exports and supplies 45% of their imports. With 50% of their milk and dairy consumption imported, the U.S. share is only 5.4%. Internal pressure is pushing to raise the import tariffs on fluid milk to 45% and to 20% on powdered milk.

El Salvador imported 12,000 MT of dry milk powder in 1994 at a value of \$25.4 million. Only 5.1% came from U.S. sources even with the Dairy Export Incentive Program (DEIP) program. By contrast, the U.S. supplies large amounts of the following commodities imported by the country: wheat, 82%; vegetable oils, 69.4%; cotton, 91.8%; tallow, 99.9%; corn, 93.7%; soybean meal 92%; and rice, 83.1%. Salvadoran exports totaled \$5.28 billion of which agricultural products were nearly 15%. El Salvador does not export dairy products.



Dairy Assessment Team - Guatemala, July 15-21, 1996

## II. EXECUTIVE SUMMARY - GUATEMALA

### Guatemala - Dairy Genetics and Milk Production

Dairy farms throughout Guatemala are struggling to produce milk in the quantity and quality necessary for them to dictate the marketing of milk to the consumer. Currently they produce about half of the milk consumed, most of it used in cheeses. The farms are mostly dual purpose operations, many milking only one time per day and most by hand.

Owners of the cattle are influenced by the traditional habits of crossbreeding dairy animals with Brahman or Zebu bloodlines to generate heat and disease resistance. This practice is needed where the management of the cattle does not control heat stress or insect borne diseases. The amount of Bos indicus blood necessary is arguable. Herd owners have found increased milk production with imported genetics from the United States, but have also found that this higher producing cow has a new set of management standards. Meeting these new management requirements in nutrition, milking, calf raising and housing is the limiting factor to fully realize the value of the dedicated, specialized milk breeds.

Lack of electricity for milking machines and milk cooling tanks is a primary drawback in many areas where milk is produced. With a reliable power source cow comfort could also be remedied with low-cost, evaporative cooling systems. U.S. dairy breeds have been introduced into the country and continue to be popular as a source of production genetics.

Artificial insemination is widely used, but semen selection is not based on market-oriented criteria for the final dairy products. With most of the production being used for the manufacture of cheese it would be logical to include high protein indexes as a criteria for semen purchases. Milk pricing is on total volume with little, if any, premium paid for milk components or milk quality.

As production per cow increases, additional attention will need to be paid to the functional traits in selecting mating sires for the herds. Feet and leg structure, teat placement and udder attachments will be important traits to be "fixed" in the gene pool. Breeders should be aware of the benefits from the hybrid vigor effect of crossbred cows using the dairy breeds. Holsteins may be a very valuable breed to be the base breed for crossing with other breeds on commercial milk farms.

Crop and feed management will determine the amount and quality of feed a cow consumes each day. The cow's intake is the key to her production potential. Pasture management tailored to maximize the feed value and volume from the land is essential to feed a high production herd. Stored feeds such as hay or silage can extend the

benefits of the rainy season and provide a steady source of feeds throughout the year. Proper techniques in harvesting, storing and feeding the silage will extend the benefits to the cow and profitability to the farm.

Training of on farm labor will be essential to care for and breed a high producing cow. Training centers, seminars and portable videos can be valuable in providing the information and stimulation to the work force to learn new methods and to adopt routines that promote the production of high-quality milk.

The dairy industry needs to become less complacent if they want to keep pace and produce rather than import dairy products. Farm organizations will need to work together to set and abide by the standards necessary to compete with imported products. A strong central organization surfacing from among the different producer groups will be vital. There needs to be a united effort by milk producers and processors working together to produce, package and promote this important food group for a country with a youthful population.

#### **Guatemala - Dairy Processing and Marketing**

The Guatemalan and Salvadoran dairy industries are under-developed and inefficient. A history of government involvement, fixed prices, poor infrastructure, a lack of affordable financing, and cultural traditions are some of the reasons for the state of the industries. The majority of Guatemala's milk is produced by small farmers using dual purpose cattle. The milk produced by commercial enterprises is going into processing plants to be sold as fluid milk, cheese, ice cream, cream or yogurt. These plants are experiencing growth and an increased demand by consumers for quality products.

The Guatemalan dairy industry is in a transition period. The current milk production is insufficient to meet local demand and in many cases is of inadequate quality. For these reasons, dairy processors began importing powdered milk to maintain their manufacturing of dairy products and to fill the growing demand in the market place. At the same time, dairy farmers are requesting protection from these imports which they fear will replace their market. Producers are lobbying their respective governments agencies to create Tariff-Rate Quotas and to raise the import tariff on powdered milk. If dairy processors are faced with higher duties on powdered milk, they will have an even more difficult time filling the demand for dairy products.

The traditional diet in Guatemala relies on corn tortillas, beans and rice, and includes heavy cream and white Hispanic queso fresco (fresh cheese) as the principle dairy products. However, in recent years there has been considerable growth in fast food restaurants



which use U.S. style cheeses such as Mozzarella, Cheddar, processed American cheese slices and cream cheese. These products are now found readily on the shelves in larger supermarkets. Most commercial dairy processing plants are gearing their processing to make these types of cheese. In most cases, they are making Mozzarella and importing Cheddar from New Zealand to process into American cheese slices.

The dairy processing plants visited in both Guatemala and El Salvador shared several characteristics. The majority of the equipment in the plants is at least 30 years old. Most plants made, or were in the process of making major capital investments in equipment. The equipment being purchased is a mixture of extremely sophisticated processing and packaging equipment and used storage tanks and cheese making equipment. All processors stated that expansion will continue if equipment could be located and funding made available. Bank interest rates which are above 20% with three-year payment terms curtail investment. Updating of dairy plants is further ahead in El Salvador.

Most plant managers stated that they are operating at about 50% of capacity. The limiting factors appear to be the availability of good milk for processing and an economic base capable of purchasing milk products. The amount of milk processed by the various plants ranges between 20,000 and 30,000 liters per day (about 8,000 gallons/day). Some of the plants are reconstituting milk powder to fill a portion of the market demand.

Other challenges milk processing plants face are as follows:

1. Lack of on-farm cooling and refrigerated transport of milk from farms to plants.
2. Outdated equipment in processing plants.
3. Limited resources for investment in training and modernization.
4. Lack of education at Universities or elsewhere on milk processing and handling as well as skilled technicians.
5. Increasing competition from Costa Rica, New Zealand and other exporters for local market share.

Milk producers and select processors expressed concern over the low duty on imported milk powder and the duty-free entry of UHT milk from neighboring countries. There is excess consumer-ready powdered milk in both Guatemala and El Salvador. Branded powdered milk sold under the NIDO and ANCHOR labels are found in all supermarkets, and in most small stores and pharmacies. There is little representation of U.S. packaged powdered milk. UHT milk is also found in abundance on supermarket shelves and the suppliers are Costa Rica's Dos Pinos and Mexico's La La.

On several occasions we heard strong negative feelings about foreign government milk give-away programs. Some processors and producers were adversely affected by the resulting increased imports in the past. Groups within both countries are trying to renegotiate the agreements and place higher import tariffs on dairy products. Importation of U.S. powdered milk will be met with strong opposition in these markets. Ingredients needed for dairy processing are being imported.

Laws against reconstitution of milk powder are in place in Guatemala, but they are not enforced. Even if tariffs are raised and the laws are enforced, current plant capacity is insufficient to provide all milk needs. More dairy processing equipment is needed in both Guatemala and El Salvador.

Dairy farms need to become more productive in order to fill the milk needs of these countries. Refrigerated transport from the farm is required to ensure better quality product and longer shelf life. It is not uncommon for processed milk to be loaded on to the back of a pick up truck, cooled by ice and hauled to the market.

It is estimated that nearly 80% of Guatemalan milk production is distributed by small independent brokers. The milk is picked up on the farm and taken to small cheese makers or sold directly to end users as a raw product (no processing or pasteurization). The remaining 20% is sold to large milk processors who process according to government guidelines.

A large portion of cheese consumed in Guatemala is made from powdered milk and vegetable fat, or is made in artisan shops with inadequate sanitary controls. Since fresh cheese and heavy creams are an integral part of the diet, the health risks associated with their consumption is high. The market for hard cheeses may be limited. There are some factories that are filling these niches, and others moving in this direction. The fastest growing segment in the cheese market is processed cheese slices. Every factory that we visited was trying to enter this market. Generally, processing facilities for cheese slices are small and procedures are outdated.

There are short term opportunities for U.S. exports of milk powder under the DEIP to Guatemalan milk processors. These companies are importing powdered milk from New Zealand and the EU to stretch the domestic milk supply and fill the demand for dairy products. In the long run, the market for milk powder may be replaced as the national dairy industry increases domestic milk production. There are also export opportunities for U.S. cheese, especially cheddar. Other products such as butteroil and dairy product ingredients may find a foothold under the DEIP. Currently, importers are buying cheddar cheese and butteroil from New Zealand to be used in processed cheese and ice cream manufacturing. Powdered milk



replacer may also have a niche in supplying the livestock industry as more calves are bottle fed and fewer nursed on the cow.

There is limited opportunity for U.S. exports of specialty cheese since the majority of the population prefers and can only afford soft white cheese. The supermarket retail industry is dominated by one chain, Paiz, with 85% market share. Only 20% of all dairy products sold at the retail level are sold through supermarkets where consumers tend to have more income and a greater taste for imported products.

U.S. companies interested in entering the Guatemalan market should align themselves with a leading milk processor who needs dairy ingredients or who is interested in a private label product. U.S. companies may also contact the Paiz supermarket chain which has a buyer specifically responsible for imported products.

Dairy Assessment Team - El Salvador, July 21 to 26, 1996

### III. EXECUTIVE SUMMARY - EL SALVADOR

#### **El Salvador - Dairy Genetics and Milk Production**

The dairy industry in El Salvador is undergoing expansion and improvement. Farmers are in the process of expanding their herds and many have made investments in technology to improve not only their efficiency, but their quality of product. The team observed more upper echelon herds in El Salvador than in Guatemala.

Milk production in the country is still at substandard levels and milk quality is low. There is some legislation that would improve milk quality, however, enforcement is not standard. We sensed attitudes and commitment on the part of individual farmers and farm organizations to work in an organized campaign to help their industry. There are still farms without electricity and many cows are milked by hand, but we observed movement toward mechanization and more modern herd management.

In order for El Salvador's dairy industry to move to the next level, there needs to be more collaboration between dairy producers and processors (such as when a milk company financed on-farm cooling tanks). Setting quality standards and paying the producer for milk quality (components and sanitary standards) would result in a dramatic improvement in the management of the farms. We saw repeated upgrades in facilities, but sometimes the easiest problem was fixed, not the one that could do the most good overall. An example is the number of misters and fans which were added in the last year. A bulk tank or improved milk handling systems might do more to deliver a quality product.

Nutrition for the cows seems to be gaining importance as farmers are working to provide a balanced ration from farm-mixed concentrates. A centralized feed mill, maybe owned by a farmer cooperative, could reduce the cost of feeds to the member and provide an even better formulation with increased palatability. Pasture rotation is practiced, but the management of the rotation can be enhanced with clipping, scaling down acreage to promote more efficient grazing, fertilization and new forage varieties.

Some herd owners are looking to import purebred cattle within the next two years. It will be valuable for them to explore the possibility of consolidating purchases in order to obtain GSM-102 backed loans. Knowledge of the loan guarantee program is limited, but even more limited, may be the banks' willingness to process the GSM-backed loans for relatively small dairy cattle purchases.



Selection of dairy genetics is often left in the hands of outside advisors or consultants. This brings another point of view, but it may be time for herd owners or managers to become more involved in the selection process. Working with cattle on the farm can tell one more about how to select bulls and pedigrees than reading brochures, advertisements or price lists. Educational programs to teach herd owners what is included in sire proof information and how to translate that into on-farm profitability are needed now.

One area that was ignored nearly everywhere we went was waste management. Manure, milking area and milk plant waste are too often allowed to run freely into the rivers and streams. The animal waste should be conserved to add to the pastures or other fields on the farms. Expanding populations will dictate a more responsible approach to the environment. Taking simple measures now will reduce the cost and impact of strict pollution laws which are certain to surface down the road.

### **El Salvador - Dairy Processing and Marketing**

1992 marked the signing of peace accords in El Salvador. Since that time, the country has enjoyed growth in the GDP of 5% to 6% per year. In 1996, the growth is expected to be less than 5% and many companies are feeling a slow down. Nevertheless, the economy is still growing, but at a slower pace. Twenty percent of the population is considered middle class and 5-10% are upper class. These sectors are growing and are economically able to consume American style foods. It is estimated that 1 million Salvadorans live in the U.S. and they remit nearly \$1.2 billion back to El Salvador each year. Bank interest rates are about 18%.

El Salvador is dairy production deficient; therefore, the country imports milk powder for reconstitution in milk processing plants. In addition, powdered milk has a large display area in supermarkets. It is estimated that 60% of the population drinks milk. APPLE (Salvadoran milk processors association) uses 15% of its milk supply for fluid product and the remaining for cheese, ice cream, cream, etc.. About 45% of El Salvador's total milk production is distributed to major milk processing companies. The other 55% is sold as raw milk off the farm directly to consumers.

The status of the country's milk supply and the influence of the nation's dairy producers have an impact on government milk policies and dairy imports. In El Salvador, dairy producers are well organized and have formed the lobbying group PROLECHE as well as regional cooperatives. These groups of producers and processors are strongly opposed to imports of powdered milk. They are threatened by imported milk powder for reconstitution and processing which is in competition with the local, fresh milk supply, and which could some day replace the market for fresh milk.

For instance, when several producers found out that processors were using imported powder milk for reconstitution to make ice cream, cheese, etc., they lobbied the government to change the law to make this illegal. There already was a law in place which prohibits the reconstitution of milk powder to be packaged and sold as fluid milk. Following the lobbying, the law was changed in favor of the milk producers and, as a result, processors became even more dependent on the local milk supply.

The export potential for U.S. milk powder to El Salvador is restricted due to the recent changes in national law which prohibits milk processors from reconstituting milk powder for use as fluid milk in bottling, cheese, ice cream or other dairy processing. Moreover, dairy producers are well coordinated in cooperatives and have an increasingly strong lobby position in government to continue limiting the imports of milk powder.

There is a niche for U.S. specialty cheese and dairy products, including yogurt, ice cream, butter and cream cheese. Five or six supermarket chains compete for customers by offering a diverse and competitive product line. One chain in particular offers an attractive display of imported cheese which is dominated by U.S. products and American-style cheese. Salvadoran tastes are "Americanized" and consumers have a preference for U.S. products over other foreign goods. It is estimated that 25% of Salvadoran dairy products are sold through supermarkets and this percentage is growing. It is certain that U.S. product sales will follow this trend. U.S. companies wanting to establish a presence in this growth market should contact the import or dairy specialty buyers at any of the major supermarket chains.

Competition with products of Central American origin is increasing for Salvadoran dairy processors. The Central American trade agreement allows duty-free trade among Central America countries. El Salvador receives imported cheese from Honduras and Nicaragua, much through informal channels not subject to quality control or sanitation standards.

Supermarkets in El Salvador are sophisticated and competitive with one another. Five or six major chains dominate the food retailing sector and compete with each other for customers. As a result, they aim to provide quality service and convenience. For instance, Multi Mart stores are smaller supermarkets that introduce a new concept of including a bank, liquor store, ice cream shop, film processing, stationery, clothing and kitchen accessories under one roof. Many of the stores we visited carry imported cheese products from New Zealand, the U.S. and other Central American countries.



In summary, the major problems facing milk processors are: 1) the local milk supply is not sufficient to meet total demand; 2) lack of training in milk handling, processing, and quality control; 3) laws that prohibit the use of imported powdered milk for reconstitution and processing; 4) imported dairy products are often more price competitive; and 5) lack of affordable financing to replace outdated equipment and improve efficiencies.

#### **IV. GUATEMALA OVERVIEW**

##### **A. DAIRY GENETICS IN GUATEMALA**

###### **Overview**

The dairy cattle industry in Guatemala is filled with tradition and comes with wide variety. The rural people have been farmers for centuries and cattle have played an important part in their lives. Cattle have been a multi-faceted source of income and sustenance as the animals provided milk, meat and a power source.

Today the dairy industry has evolved into two major segments: The milk-only farms and the dual purpose farms where cross-bred cows are raised for meat and income is supplemented with milk sales. The majority of cattle fall into the second group, although they are far less productive per cow than the herds where management and breeding have focused on milk alone.

Environmental factors appear to dictate the development of the dairy industry within Guatemala. Herd owners are looking for cattle to perform in the hot, humid climate and, at the same time, to be profitable and productive in both the rainy and dry seasons. Lacking quality stored feeds such as dry hay and silage made from grasses or corn based forages, most of the cattle have to perform under stressed conditions during the dry months.

The indigenous herd has undergone natural selection as a result of ticks and tropical diseases. The Zebu based breeds have fared best against liver flukes, lung worm and intestinal parasites. Resistance to heat and ticks seems to have a large influence in cattlemen's preferences in base breeds for the national herd.

With the recent removal of price controls on milk, producers are interested in increasing milk production per animal. The American Holstein enjoys an international reputation as a great producer, however, she is regarded in the tropics as a non-survivor and a problem cow needing special care. In Guatemala, there is positive evidence of the benefits of the American gene pool for production where either pure Holsteins or high-percentage Holsteins had been introduced. Some had arrived through importation of live cattle years ago. Most herds had been upgraded through use of imported frozen semen used on the domestic populations.

###### **The National Dairy Herd Today**

The average Holstein or high-percentage Holstein we viewed was smaller than in the U.S. This is not to suggest that size should become a criteria in genetic selection at this point. Many of the cows observed would be called "frail or weak", and this is likely due to a combination of factors including: inadequate nutrition, heat stress, and calfhood diseases leaving permanent scars on the cow's respiratory and digestive systems.



Confirmation of the cattle was what would be expected from crosses with native cattle and the use of semen that is priced in the lower echelon of the American genetic markets. Udder confirmation was acceptable for the most part but it is necessary to keep in mind that these udders do not experience production stress as it is known in the U.S. With little machine milking, the importance of teat size, placement and suspensory ligament are not magnified as they will become in the future. Traits such as teat size and milking ease are not as critical in the selection process when milking by hand or suckling calves rather than using milking machines.

A significant number of herds had some Brown Swiss influence. Herd owners expressed preference for Holsteins because they were more productive. However, upon more questioning, they praised the brown cows as being more robust, having stronger feet and legs and mothering good calves (interpreted to mean healthy calves with good body condition). Very few pure Brown Swiss were seen and even fewer owners reported using Brown Swiss semen.

Some herds had started using a three-way crossing plan with Holstein sires used on Brahman x Swiss cows or Holstein sires on Brahman x AFS (Australian Friesian Sahiwal) cows. The  $F_1$  generation was always better than the parent generation but, more often than not, the second cross was back to Brahman or Zebu bloodlines. The Gyr breed has seen some recent growth and it is not surprising to expect that a "natural tropical breed" will be perceived as useful in a similar climate.

Actually the two herds closest to U.S. standards for type and production were Jersey herds, both originating from U.S. stock. One was recently imported and the other had been imported about 15 years ago and has been using imported frozen semen from the U.S. The three Jersey herds we visited were above average or even high end whose managers allowed the genetics of the cattle the opportunity to be expressed. In the conditions we observed the Jersey cow will continue to have opportunity to do well in Guatemala.

In order to overcome the prevalent notion that all cows need Brahman or Zebu influence of some kind in order to excel in the tropics, more success stories are needed similar to the Parma Jersey herd or the Megalac Jersey Dairy operations. In both cases the success of the herd is more management related than genetic. However, it is a strong statement that imported genetics can, and will, outperform the native cattle under proper management.

### **Reaching For Genetic Potential**

We observed increasing use of corn silage and attempts to manage the feed supply to offer a more consistent diet year around. With this trend cattle will spend more time in confined corrals and on concrete. Feet and leg characteristics will play an increasingly important role in cow longevity as the herd spends more time in confinement and on hard surfaces.

Most herd owners visited relied on outside consultants (veterinarians, semen sales representatives or others) to recommend bulls and to make matings. Few herd owners had ready knowledge about the service sires they had purchased and were using or the sires of the cows in the herd. They all knew what cow was milking the most or was a herd favorite, but few could identify her sire. Using sire identification on ear tags would assist owners in learning which bulls had sired the most productive and desirable cows.

Genetic selection was highly influenced by the artificial insemination (A.I.) company representative or sales person. Service and price are stronger priorities than genetics at this time. We did visit one herd with a unique employee incentive program to encourage the use of better bulls (fortunately tied together with a plan to improve cow heat detection and conception rates), all adding to the bottom line profitability of the herd.

We were, frankly, surprised by the number of herds recording milk weights from each cow on a daily basis. This may be more of a monitor and payment plan for the employee milking the cow than a critical measure of the cows' value in the herd. No one ever mentioned selling a cow for low production. From a genetic improvement standpoint the production capability of the cow could be used to select bull mothers when bulls are still used for natural service, particularly during the hot weather months.

### **Genetics For The Local Milk Market**

Throughout the country the consumption of dairy products is dominated by processed products like cheese, especially fresh cheese. Little, if any, attention is paid to the components in the milk and their effect on cheese yield. Selection of semen from protein improving bulls would result in a higher product yield at the milk processing plant. In order for this to have any real value to the dairy farmer, the processor would have to establish a quality premium for the milk that has the best yields of finished product. Other factors such as cleanliness and cooling of the milk are also critical to the concept of product yield.

With the current demand for protein improving bulls in the U.S., the semen that moves into the lower cost per dose Latin American



market is often from poorer bulls for protein improvement. Milk pricing policies in many of these countries are based strictly on fluid volume and do not compensate for components in the milk, except for butterfat from some processors.

## **Resources**

Nearly every farmer is truly interested in improving their herd and their individual cows. They have few resources available to learn about genetics and management. The most frequent source of management and genetic information was the Spanish edition of *Hoard's Dairyman* (previously available, but not nearly as valuable, only in English). *Lechero Latino* also reaches many farms, however this is regarded as a commercial sales magazine for equipment and less of a management authority or reference.

The dairy farm community had very little understanding of the GSM-102 or GSM-103 programs which are available for genetic improvement purchases. Perhaps an even larger obstacle is the lack of interest by the in-country lenders to utilize GSM for livestock loans preferring to use them for larger dollar projects in cotton or grains. It may take some collaboration by farmer groups to consolidate their interests into large purchases in order to attract the banks to dairy farming. They will still need to meet the rules for collateral and other limitations set by the banks.

## **Model Farm - Training Center**

There would be great interest and value in a centralized training center or model farm which could be used to validate the use of specialized breeds for milk production. Such a unit within Guatemala would have more value as a reference than a field trial done at a university in the U.S., although the U.S. universities have provided a major service in the education of many of the trained professionals in the country.

A training center could demonstrate proper handling and use of feed commodities, research additional by-products for feed alternatives and suggest feed formulations that would aid in productivity of the cattle. We saw heavy use of ground grains in feed rations, but more can be done to add palatability to the feed. The center could serve as a test station for cattle breeds and even crossing of cattle breeds. Recorded milk production could be used as a tool for genetic selection of herd replacements and young herd bulls for sale to commercial herds.

Feed and care of the "high production cow" could be taught through seminars or on site training programs. Currently there is a dire shortage of qualified farm labor to manage herds with production averages above 20 - 25 lbs. per cow per day. The training center

could work with the processors in the industry to consider factors such as milk components and quality factors affecting product yield and teach these values to the local farm community.

A true need lies in the absence of short courses and technical programs available either within Guatemala or at U.S. centers (universities or private farms). A key would be to have the instruction and course materials in Spanish. While English is understood by some farm owners, few of the farm employees and many owners do not understand English.

### **Artificial Insemination Industry**

The A.I. industry can expect to see increased sales of semen in Guatemala as long as the demand for high production U.S. genetics remains strong. Canadian companies have a small, but visible, presence in Guatemala. Australia is starting to creep into the market, and, at some point, the Europeans will take a run at the market. However, at this time, the market has little interest in European genetics and price considerations may keep the market in the Americas for a while longer. Look for Costa Rica to have an influence on the cattle of Guatemala, as they are regarded as the jewel of Central America, as far as dairy farming is concerned.

Keys to increased sales will be reputable agents in the country, service on the farm and competitive pricing. Companies that can provide a mating service will have an advantage in sales. Companies that can provide training in heat detection and proper insemination techniques will gain a reputation for higher semen quality. Poor type bulls, particularly regarding udders and feet and legs, will start to become more obvious as production levels and nutrition improve.

### **Breeds & Breed Associations**

The dairy breed associations in Guatemala are not particularly strong or effective, although cattle owners do seem intent on keeping up with registration papers. There seems to be movement to consolidate the recording work of the various breeds into one quasi-government office. There may be a faster consensus if there were no government involvement. It is not surprising that a merged association is threatening to some groups and members, recalling the strong resistance to similar efforts in the U.S. The most visible breed registry we saw was by the Brahman breeders. They may have the clout to bring the groups together for common interests and allow each group their individual identity for breed specific issues.

Breed association use of FAS funding through the Foreign Market Development program would be better spent to bring Guatemalans to farms in the southern U.S. than in funding judging expeditions in



Guatemala. Associations are not in need of competitive dairy shows at this time. However, the importance of participation with Spanish language literature in a trade show booth at Guatemalan national agricultural events should not be overlooked. More benefits would be derived from a series of regional seminars on managing and breeding cattle than in judging shows at this time.

Holsteins enjoy an advantage as Guatemala's primary choice as a specialized dairy breed. Most climatic conditions found in the country are harsh and detract from the benefits that Holsteins offer. Long term growth for Holstein exports will require establishing the breed as a base breed and acceptance of crossing with other breeds. The highly specialized farms will still prefer purebreds. Rather than dilute them with non-dairy breeds, as is being done now, a planned effort to market purebreds as the foundation for Holstein x Brown Swiss or Holstein x Jersey breeding programs could look attractive in the marketplace.

The better managers will find the breed they prefer and exploit their benefits through good management. The rank-and-file cow owner may need something other than a purebred cow to compete in the Guatemalan environment.

Brown Swiss breeders have an opportunity to promote their breed as a proven heat-tolerant, high-producing cow with strong udder and feet and leg traits. Light color is certainly an advantage in the hotter climate. Brown cows are often seen in the open sun grazing while the black cows are seeking shade. The protein advantage of the milk should be a prime selling point because much of the milk production is used for cheese, although payment on a protein basis is still in the future. Brown Swiss have crossed well with the Brahman to make better uddered cows. The salvage value of Brown Swiss cows and market value of the bull calves into the pasture-fed meat animal market should help make the breed economically attractive beyond just milk production.

Jerseys have an advantage, as some of the better managed farms are now successful with Jerseys. Certainly, the high protein aspect of the milk fits the product usage for cheese, but payment is still not value based. The body size and efficiency of the Jersey will be very useful as farm acreage and facilities are often limited. Heat tolerance, calving ease and early reproductive maturity all add to market advantages which can be exploited in Guatemala. We frequently heard farmers complain of the high cost of raising their replacements. Jerseys might be an answer.

### **Embryo Transfer**

There is currently little interest in and little need for embryo sales to Guatemala. Very few technical people are trained in the techniques of embryo transfer. Resulting pregnancy rates would be

too low to make embryos very high priced on a per calf basis. Recipient management would also have a negative impact on pregnancy rates. Significant genetic progress can be made with selected genetics in frozen semen. On a cost basis it is probably more effective to ship pregnant live cows, closer to reaching the payback period as a milking animal, than to import embryos, deal with recipient selection, pregnancy rates, live birth rates and then wait until the embryo transfer calf reaches productivity.

## **B. DAIRY PRODUCTION IN GUATEMALA**

Political instability and violence in Guatemala over the past decade cut sharply into the progress the dairy industry had achieved in the 60's and 70's. Government price controls provided disincentives to herd growth and efficiency. Faced with lower priced imported products (including illegally transported competitive products from other Central American countries), the dairy farmer has focused on maintaining existing production rather than expansion.

Our travel in Guatemala took us into four regions of the country, each with particular constraints for production and opportunity for industry growth. Most of the differences are weather related or market related.

### **Facilities & Equipment**

The major obstacle to progressive management is lack of availability of electricity or a steady reliable source of power. With cattle located in the rural regions of the country, many farms have no access to electricity. Others have experienced problems with intermittent power supply, necessitating alternative power sources from generators. Some of the larger installations with water nearby have developed their own hydroelectric plants.

We visited farms with power and modern equipment available which still preferred to milk by hand. Labor costs in the range of \$2.50 per day give manual labor an advantage over machinery, considering maintenance, repairs and operating costs. With production levels ranging from three liters per day up to the national average of six or seven liters the letdown response in the cattle does not fit well with machine milking. Without proper letdown of the milk the machine may actually cause increased incidence of mastitis and udder irritation. Injectable oxytocin would assist in milk letdown, but no cost/benefit analysis was done at these production levels.

Many of the cows we saw, particularly in the Santa Rosa region were fully intended as dual purpose animals, raised for both milk and



meat production. These cows were milked on a one time per day frequency, mostly by hand, and with one quarter of the udder not milked, but saved for the suckling calf. Machine milking competed with the calf for milk or the calf must be fed whole milk or a powdered milk replacer from a pail.

More important than milking machines for increasing milk quality would be milk cooling systems, either cooling tanks, plate coolers or water baths for the milk containers. Most milk is transported to a collection center or directly to the processor at or near body temperature. In order to control bacterial growth the hauler often adds hydrogen peroxide to the milk. This is later precipitated out of the milk but milk quality is certainly compromised. While filters or strainers are available and recommended, contamination of the milk from dirty cows, hair, flies and particulates in the air is evident in the sediment at the milk plant. A closed system using machines would help control contamination of the milk at the farm.

There appears to be a major need and market for small, used milk cooling tanks in the 300 to 1000 gallon range. Reduction of the duty on such equipment would make them more affordable. Used milking equipment, including pipelines may also prove to be a cost effective investment as herd sizes increase and labor becomes a higher component of production costs.

Training in cow management and cow comfort will assist in raising production levels. Maintenance of the resting area with bedding or rubber mats can aid in cow hygiene and comfort. Fly control and temperature control using water misters and fans in the resting and eating areas will aid in dry matter intake and encourage higher production. "Cooled" cows will also have a higher level of fertility and heat detection will become easier.

We did observe some cows and young animals that were maintained nearly all day on concrete. This practice is often instituted to combat muddy or hot environments. This usually leads to increased stress on the feet and legs of the animal. Having the animals spend at least part of the day on pasture, dirt or a bedded area will add to the productive life of the cow.

## **Feeding**

The most progressive herd managers such as the Pineda Brothers, Finca Santa Barbara and Parma Dairy, all located in different regions, were working to find and utilize new varieties of grasses in the pastures. They utilized ensiled corn fodder as a feed source during the dry season. Each of these herds realized higher production and enjoyed healthier cattle in their herds.

Intensive pasture management and rotational grazing practices will increase the feed value of the main source of feed. Clipping the pastures assists in weed control and promotes even and healthy new growth in the field. Movable electric fencing can control cattle movement and grazing space to get more efficient use of the pasture. Reseeding with selected, high yield grass varieties supplemented with fertilization (chemical or natural) will enhance production in the herd and increase profitability. Finding optimum maturity of the grass when the cows have access to the pasture will balance feed value with total yield and enable the pasture to supply more of the nutrition requirements replacing costly concentrates.

Where cattle populations would allow there may be great benefit and savings by having a regional feed mill. This would allow more utility of by-product feeds, greater price negotiating power by volume purchasing and provide a more uniform, balanced ration to fit the needs of the herd. A single specialized mill will allow more flexibility to customize rations and adjust rations to meet customer needs or react to supply and commodity price fluctuations. Perhaps equally important would be the use of roller mills and pellet machines to increase palatability, improve digestion and feed intake over the use of finely ground grains as seen throughout the country.

### **Other Considerations**

Currently there is no official milk recording system as there is no government funding dedicated to dairy improvement programs and herd owners are not in a financial situation to fund this type of program. More herds than expected maintain their own records. The Jersey herds had the higher averages and were the best managed.

Nearly all frozen semen is from the United States with limited amounts from Australia and Canada. There are no artificial breeding centers in the country. Natural service still accounts for the majority of the breeding in most herds. Some fresh semen is used for A.I.

Pollution control and other environmental concerns are currently overlooked in most instances. Manure management and water purity have to take on added importance. As the population becomes more highly educated and affluent the demand for environmental management will increase dramatically. Agriculture, along with transportation and industry will be the targets. Farmers should look to collection tanks, or other methods to control runoff and maximize its use as a natural fertilizer.

Education is the key to any country's progress and Guatemala is no exception. There is a vast opportunity for youth programs such as 4-H and FFA in agriculture. Farm exchange programs with the United



States would also be valuable provided the visa regulations could be handled. The National Agricultural School could be instrumental in providing a hands-on farm management program in which students could gain practical experience and business experience while training for future employment or farm ownership. There is an excellent prototype program at Washington State University (C.U.D.S. program) and similar programs at other schools.

We encouraged the National Agricultural School to emphasize short courses in farm and dairy herd management. Guatemala could also utilize farm newsletters with management information or details of new varieties of pasture grasses for example. Tours to successful farm operations could be a valuable training tool. Any programs that would encourage travel to management oriented events such as World Dairy Expo in Madison, WI would further motivate the industry leaders to be innovative and progressive in their dairy operations.

### C. DAIRY PROCESSING - Observations

#### **Raw Milk**

Raw milk quality is generally poor. Due to lack of on-farm refrigeration it is common practice to add hydrogen peroxide to milk to kill bacteria. It should be added immediately after milk is collected, but can be added anytime with the same bactericidal effect. This could lead to product abuse. Although bacterial cells are destroyed, enzymes produced by the bacteria are unaffected. The vast majority of milk sampled had a distinctive flavor that may be related to enzymatic breakdown of milkfat and proteins. Although this flavor was offensive to team members, the effect it has on product sales in Guatemala is unknown.

The use of hydrogen peroxide also allows undesirable alteration of the milk to occur with respect to composition. Since all bacteria are destroyed, it is possible for milkfat to be skimmed and replaced with vegetable fat.

#### **Processed Milk**

Negative publicity and perception among consumers concerning quality of dairy products have depressed fluid milk sales. The industry is trying to combat this publicity by working with producers to improve product quality. Every plant visited was in the process of remodeling and upgrading equipment. All plants were trying to improve milk pick-up methods and schedules. The need for on-farm refrigeration is recognized, but obtaining funding to purchase equipment is difficult. Low on-farm production also makes the justification of cooling units difficult. Although there are some over-the-road tankers, the majority of the milk is delivered in 35 to 50 gallon plastic barrels by flat bed or pick-up trucks.

The plants that we visited were all multi-function plants producing a wide variety of products such as milk, ice cream, juices, cheese and cream. Milk is packed in form, fill and seal 1 liter bags, blow-molded bottles and paper cartons. There are some signs that specialization of products by the plants are occurring which is a good strategy due to the small market size. There are some companies making only ice cream, and another making only cheese products. The latter company has just installed a major line to package fruit juices and pure water. There is no association of these plants with a U.S. or EU counterpart.

Due to the lack of fresh milk, recombination of powdered milk is often used to stretch the milk supply. Although there are laws against this practice, they are not being enforced. Farmers need to be encouraged to allow reconstitution of milk powder to expand the market for dairy products that could be capitalized on later by the farmers when they achieve higher farm production.

### **Cheese**

Plants making cheese other than the queso fresco type must use catalase to neutralize the hydrogen peroxide that has been added to the milk. The market for these hard and semi-soft cheeses appears to be small compared to Hispanic types. Some cheese is being imported from Europe, the U.S. and New Zealand, but there is some local production of excellent quality cheese. Queso fresco comprises over 85% of total cheese production. Since this cheese is made by adding rennet to unfermented milk, collecting the coagulum and mixing in salt, it is very easy to make. The majority of this cheese is being made in small, unregulated, homestead factories. Extreme variations in the sensory quality and bacterial quality of these cheeses is evident.

### **Butter**

There is very little butter being made in Guatemala. Butter that is found in the market and restaurants is imported primarily from New Zealand. Excess milkfat is sold as fresh cream typically packaged in expensive plastic bags. The percent fat content of the cream was seldom stated, but ranges from 25 to 40%. Imitation cream, where fat is derived from vegetable fat is sold next to fresh cream in the dairy displays.

### **Frozen Desserts**

Several frozen dessert producers were making very good products. The majority of ingredients, other than milk, milkfat and powdered milk, are imported from suppliers in the U.S.



**D. DAIRY MARKETING - Observations**

Guatemala imports dairy products from Costa Rica, New Zealand, Europe and the U.S. Although some U.S. dairy products are found in the stores such as butter, cream cheese, evaporated milk, and ice cream novelties, it is the large multinational food companies such as Kraft and Hershey's that enjoy the U.S. market share. Food retailing ranges from small residential grocery stores or tiendas to small supermarkets to large, modern U.S.-style supermarkets. The leading supermarket chain in Guatemala is Paiz and it enjoys 85% of the food retailing market.

About 80% of Guatemalan dairy products are sold to small tiendas which pay cash to the processor. Less than 20% of Guatemalan processed dairy products are sold in supermarkets. Supermarkets are not an attractive distribution outlet for many dairy processors: 1) supermarkets require 30 to 60 day credit terms; 2) they want to fill all the available shelf space but are not able to sell all of the products they receive; 3) unsold product is returned to the processor past the date of freshness, unpaid and basically at a loss; 4) the processor must hire someone to stock the shelf in the store; and 5) the store will take an 18% to 24% markup on products sold.

We were impressed by the dominance of U.S. consumer foods on the store shelves in the supermarkets we visited. U.S. foods on the store shelves have English labeling. The refrigerated dairy sections of these stores are large and mostly feature Guatemalan made products. The dairy varieties include Mozzarella, Cheddar, processed cheese spread and fresh cheese. Costa Rica's brand, Dos Pinos, follows with the second largest market share with butter, cheddar, Mozzarella, and UHT milk in the non-refrigerated section. Butter was sourced from the U.S., New Zealand, and Denmark. Yogurt is supplied by a few local processors including one who is licensed by a U.S. company and some U.S. imports.

Powdered milk is an important part of dairy retailing in Guatemala and fills nearly half an aisle in stores. An estimated 14,000 MT are consumed a year by the local market. Consumers believe powdered milk is cheaper than fluid milk as well as better quality than local product. However, nutrition has the potential to be compromised if consumers add more water than the recommended use, or if they use contaminated water. Guatemala does not have dehydration facilities to produce powdered milk, so product in the supermarkets are imported from New Zealand, Nestle (Honduras), and several EU countries.

The New Zealand Dairy Board is doing some generic cheese advertisement (with their brand included) to promote consumption of dairy products. The ads are targeted to mothers and are through TV commercials run during soap operas. There is a need for more

generic advertisement and ad campaigns run by individual companies.

The New Zealand Dairy Board has good data on the dairy market situation. For instance, per capita consumption of milk is 39 liters/year. This represents nearly four times less than per capita consumption in Costa Rica and far less than in the United States. It is estimated that 58% of Guatemalan children from ages 0 to 5 years suffer from malnutrition. There is room for growth in the consumption of milk and dairy products; however, the negative perception of Guatemalan consumers regarding local milk supply needs to be changed and the quality of milk products improved.

### Company Meetings

#### **Foremost Dairies de Guatemala, S.A. (dairy processor)**

We met Ing. Erick Archila, General Manager; Paulino Diaz, General Administrator; and Carlos Figueroa, Sales and Distribution Manager, Foremost Dairies de Guatemala, S.A. This firm was established as a joint venture partner with Foremost in the U.S. about 30 years ago. In 1972, the U.S. partner broke off ties with the Guatemalan firm and Foremost Dairies de Guatemala continued independently.

The plant we visited makes ice cream novelties and distributes them largely through push carts and small tiendas or corner stores in residential areas and not supermarkets. Foremost's product line is about 45% fluid milk, 35% ice cream, and the remaining is cream cheese or butter. In addition, they import orange juice concentrate from Florida and reconstitute it for distribution. Of the fluid milk market, the line of flavored milk such as chocolate and strawberry is growing. Foremost also foresees growth in three main cheese varieties: American, cheddar, and Mozzarella.

Foremost processes 20-22,000 liters of milk per day which is below the plant's capacity. However, their market is growing. Foremost buys milk powder through a Dutch broker and the product is sourced from England, Ireland or even the U.S. when the price is competitive. Due to the poor and limited Guatemalan milk supply, Foremost is in favor of imported milk powder for reconstitution in its processing. This enables them to maintain a higher quality finished product.

Foremost Dairies envisions the following goals: a national campaign to increase the consumption of dairy products, and an increase in local milk production as well as improvement of its quality. Foremost representatives have visited dairy processing plants in the U.S. and believe that Guatemala lags 20 years behind the U.S. in processing technology and equipment. Foremost was pleased to learn of USDA's Emerging Markets Program and is interested in follow up activities. Foremost is also interested in joint venture possibilities with U.S. dairy companies.



### **Superior (dairy processor)**

Superior processes 20,000 liters of milk per day. This is largely processed into queso fresco (white Hispanic fresh cheese), cream cheese, processed cheddar slices and other Hispanic varieties. A representative travels to the U.S. to visit dairy operations as well as attend the Food Marketing Institute (FMI) supermarket show. Mr. Sandoval distributes 300 product lines, some portion control, to restaurants and hotels. Distribution is to Westin, Crown Plaza, the Radisson, the Princess Hotel, and soon the Hyatt among others. Mr. Sandoval is interested in U.S. portion control products, such as butter, for distribution to HRI.

Mr. Sandoval is also interested in diversifying Superior's product line by adding Mozzarella or doing a joint venture with a U.S. firm for producing cheddar or cream cheese. Superior currently imports cheddar from New Zealand and uses it as a 25% content mixed with their own cheese.

Superior markets its product line to consumers at both the high, middle, and low income level. They are interested in producing imitation cheese products that will be available at a lower cost for the low income consumers. They are looking for U.S. suppliers of imitation cheese powder mix, cheddar (40+lb. blocks), pure cream, spreadable cheese, margarine, and/or portion control butter.

### **La Palma (dairy and beverage processor)**

La Palma processes 30,000 liters/day of pasteurized fluid milk, cream, and queso fresco. La Palma recently purchased four 6,000 gallon used storage tanks from the U.S., and plans to buy four more. La Palma imports orange drink and other flavor concentrates from the U.S. and reconstitutes, bottles and distributes beverages. Although La Palma is operating below the plant's capacity, they are enjoying a 5% increase in growth per month in 1996.

La Palma owns a fleet of 125 trucks which handles 80% of the company's product distribution. The product lines are distributed 80% in Guatemala City and the remaining 20% in other major cities. Private distributors will charge between 8% and 10% to distribute the products.

Due to the fluctuations in the local milk supply, La Palma imports milk powder to supply between 20% and 35% of its fluid milk needs. As the international prices for milk powder rise, Guatemalans will face higher costs and will face difficult times. Costa Rica has penetrated the market with UHT milk and other dairy products. There are no producers of UHT milk in Guatemala. Guatemalan milk processors want to defend the local market but don't have the production capabilities. They need support to maintain local market share.

### **Lacteos Xelac (coop and dairy plant)**

Lacteos Xelac is a dairy cooperative which was established 22 years ago and currently has 80 members. We visited the small plant which processes 4,500 liters/day into pasteurized fluid milk, cream, yogurt and European style cheese such as Gruyere, Camembert, Emmental, Parmesan and Mozzarella. Due to the growing demand for hamburger and pizza consumption, they are interested in producing American, cheddar and other U.S. cheeses. Xelac needs more milk and wants to increase their processing to 9,000 to 12,000 liters/day.

Xelac has a good reputation for their products and plans to build another plant near Guatemala City. Xelac distribution is currently to 150 small stores within 12 km of Quetzaltenango. They sell their products to restaurants and hotels. They have decided to focus on high quality products and European style varieties instead of queso fresco, etc..

Xelac only uses the milk from their coop members for processing and is not in favor of imported milk to supplement the short supply in the dry season or to fill the growing demand for products in general. Xelac works closer with the member dairy farms than the other processors we met. They negotiate the milk pricing and farmers are paid a premium for quality milk. Some members have production as high as 27 liters/cow/day.

Xelac has many of the same concerns as other processors: financing, foreign competition, need for new/additional processing equipment, need for increased local milk production, need for a national publicity/advertising campaign to increase consumption of dairy products, and lack of support from the government, in general, as well as lack of enforcement among all processors.

### **Parma (dairy operation and plant)**

The Parma milk processing plant is owned and managed by the third generation, and the first in the family to study cheesemaking in the U.S. Parma receives milk from 65 farms who are on the payroll of the company. Of this amount, Parma picks up milk from 55 of the farms. The remaining 10 suppliers are independent brokers/trucks who pick up the milk on farms and deliver it to Parma. All milk is transferred to the plant in 120 kg plastic barrels and is warm. On average, the plant receives 250 kg's of milk/farm/day. The milk is tested for acidity, then is filtered and the hydrogen peroxide is countered before pasteurization. The plant has the capacity to process 50,000 liters/day, but actual processing volume is below this amount. Cheese production is 3,000 kg/day. From 12 to 15 different types of cheese are produced as well as cream, yogurt, petite Swiss, and others.



The biggest problem for Parma is the poor quality local milk supply. For this reason as well as the seasonal drop in milk supply, Parma imports New Zealand powder milk for reconstitution. Parma also imports cheddar cheese from New Zealand to use in processed cheese slices because it is cheaper to buy the product from New Zealand than to make it themselves.

#### **Monte Maria (dairy operation and plant)**

Monte Maria is owned by a large agricultural and non-ag group of Guatemalan businessmen. The company is very concerned about making and distributing quality products and appears to have good financial backing. The cheese processing plant we visited is located adjacent to the dairy farm operation and milking parlor. Monte Maria is the distributor for the U.S. bovine semen company, 21st Century Genetics, and BouMatic (milking machines and cooling tanks). The dairy operation is in the process of installing new milking machines and cooling tanks.

The plant is currently processing 14,000 liters of milk per day into Mozzarella, queso fresco, processed American cheese slices, fluid milk in plastic bottles, cream, and butter. The product line is distributed in supermarkets and restaurants in Guatemala City and other urban areas. Over the past month, the sales of the cheese product line increased 35%. The plant is optimistic the growth and market potential will remain good and has plans to reorganize the current plant and build another.

Juan Carlos Fumagalli, General Manager of Monte Maria, has traveled to the US to buy cheese making equipment and other supplies. He requested price quotes and information from the U.S. on: Cheddar cheese 28,000 lbs., Mozzarella, milk replacer, milk powder, and plastic bags for packaging.

#### **Pops Heladeria (ice cream plant)**

We met Oscar Sanchez, General Manager, Pops Heladeria Guatemala, S.A. to discuss the ice cream market. Pops Heladeria is the only company in Guatemala that produces only ice cream. Pops holds 25% of the ice cream market in Guatemala. Their ice cream is compared to a super premium product and 75% of sales are through Pops retail outlets. They are adding a seventh ice cream store this year and it will include a drive-through window. The largest selling items are milk shakes, sundaes, and cones. There is an increase in sales of half gallon containers from the stores as well.

Pops produces 20,000 gallons of ice cream a month, and 3,000 gallons/month of sorbet. Ice cream consumption is lower than in other countries due to the large lactose-intolerant indigenous population. Pops is looking to increase its product line by including popsicles in the near future

Constraints for ice cream sales and distribution include the following issues. 1) There is a lack of electricity among a large portion of consumers and lack of freezer storage at home. There is also a problem with the control of steady electricity for freezer storage in supermarkets. 2) Many consumers are lactose intolerant. Dos Pinos of Costa Rica developed a lactose-removed milk and it is doing well in the market. Sorbet is also doing well among lactose intolerant customers. 3) The contaminated milk supply.

### **Samaritana Supermarket**

We met with store managers and buyers to find out the trends and buying patterns in the supermarket regarding dairy products. The market leader is Nestle's Nido milk powder which is manufactured in Honduras. The product is sold in 2.5 kg or 1.8 kg cans and has the highest sales record because consumers prefer the taste and believe it is the best bargain. One or two large cans are purchased by a typical consumer per month. Other milk powders on the shelf were Dos Pinos of Costa Rica and Klim of Ireland. The U.S. boxed product, Carnation, is on the shelf, but is not successful because the tin/can packaging is preferred over boxes. Goldstar brand of Ireland has milk powder packaged in Guatemala, but still consumers prefer Nido, even at 10 quetzales more for the same quantity because of the packaging and brand loyalty.

When Dos Pinos introduced UHT milk, the sales of fluid milk dropped 20%. Mexico's La La UHT milk entered the market last year, but consumers prefer the taste of Dos Pinos. Flavored milk is purchased more frequently than plain milk. Fluid milk sales are constrained by the perception of poor milk quality. Parma is the market leader for cheese sales.

### **Others**

La Raclette is an example of a residential store specializing in European food products including an impressive array of imported European cheese. The store had a small display of Guatemalan cheese located in the deli meat counter. The package size is approximately 0.5 lb and the price of imported EU cheese is about double the price of Guatemalan product. The product display in the refrigerated coolers is very attractive.

The largest supermarket chain in Guatemala, Paiz, was conducting an American Foods in-store promotion with support of the U.S. Embassy's Agricultural Attache during our visit to Guatemala City. Paiz clearly dominates the food retail sector and is a major distributor of U.S. consumer foods. There are a few imported U.S. dairy products displayed including yogurt, ice cream and cheese.



There is considerable effort expended to establish processing and producer organizations. This is a difficult process due to the competitive atmosphere present in the marketplace. It was very hard to collect information concerning pricing. The team was denied access to supermarket shelves on more than one occasion by the personnel working for the country's largest supermarket chain.

There was little evidence of promotional materials other than a few billboards for Nestle's Nido and some TV ads during soap operas. A coordinated campaign effort is needed to overcome the negative image given to fluid milk products.

## V. CONCLUSIONS-GUATEMALA

The largest problem facing the Guatemalan dairy sector is the perception of the poor quality of the fresh milk supply. The politics of the Government of Guatemala over the past 20 to 30 years have created conditions which allowed the decline of the dairy sector. Fixed milk prices gave dairy farmers no incentive to produce or invest. As a result, nearly 90% of the dairy producers left the industry more than 20 years ago, turning to more profitable agricultural sectors such as coffee and sugar.

Those who continued as dairy farmers switched to dual purpose cattle which reduced the average production per cow. And, during the same period, few investments were made in milking machines, milk handling equipment or cooling systems. Since milk is generally not cooled on the farm, except on a few select operations, many farmers began adding hydrogen peroxide to the milk to kill bacteria. It is also acknowledged that many producers add water to the milk before distributing it to processors and end users to make more money. In summary, milk delivered to processing plants and end users is often poor quality.

As a consequence of the widespread recognition of the poor milk quality, many processors do not want to pay high prices. At the same time, producers feel they are not making enough money for the sale of their milk. The most popular dairy product in the supermarket is powdered milk supplied by Nido of Nestle. This product is preferred because of its taste and reliable quality and good price. The second leading dairy product is UHT milk supplied by Dos Pinos of Costa Rica. When this product entered the market five years ago, it displaced the fluid milk sales by about 20%.

Imports of milk powder are needed to supplement the milk supply, especially during the dry season when local production drops. In addition, processing plants are limited by the outdated equipment in the plant. They are interested in automating more of the processing but are limited by the expense.

The growth in consumption of hamburgers, pizza and fast food in general is stimulating the demand for American cheese slices and Mozzarella cheese. There are good opportunities for growth in these product areas.

Ice cream and frozen desserts are a niche market in Guatemala and are largely consumed in wealthier, residential, urban areas. Sales are constrained by the lack of electricity in rural areas and in many homes. The inconsistency of electricity in the freezer storage at supermarkets is also a problem because ice cream frequently softens then refreezes and the product quality is diminished. The market leader in ice cream production and distribution sells about 75% of their product in specialized ice cream shops.



Yogurt represents a small segment of the dairy market. It was introduced about 5 years ago and this segment is largely filled by domestic production. Imported yogurt from the U.S. costs about \$1.00 U.S. for an 8 oz. container. Yogurt is expensive for the average consumer.

New Zealand butter dominates the butter market in Guatemala and is found readily in supermarkets, restaurants and hotels. Dairy processors make more profits by selling cream than processing it into butter. It is cheaper for butter to be imported from New Zealand than for processors to make it in Guatemala.

The average per capita consumption of dairy products is 36 to 39 liters/year. This suggests substantial room for an increase in consumption as the quality of milk products improve and personal incomes rise.

The education level of the majority of cattle owners will limit the advance of technology in the immediate future.

Available animal genetics are far ahead of management and nutrition for the vast majority of the country. It will be important to continue to increase genetic levels focusing on functional traits and production in order to sustain high levels of milk production in the hot, humid climate.

Cross breeding has focused too heavily on Brahman and Zebu blood lines. Specialized dairy breeds can be a base of herd genetics with increased management.

A training center or model farm would be invaluable to teach and demonstrate cost effective management skills. The farm could be a showplace to demonstrate dairy breeds and successful dairy cross breeding.

Feed cost controls and quality can be enhanced with a central mill.

Simple investments in cow comfort and hygiene will improve milk quality.

More intense management of pasture lands using waste manure, small paddocks and clipping of the pasture will enhance productivity.

## VI. RECOMMENDATIONS-GUATEMALA

USDA/FAS should provide technical assistance to help ensure that Guatemalan milk processors and end users have a reliable, quality milk supply. This will increase the demand for dairy products locally and will have a beneficial impact on the economy. Although U.S. exports of dairy products are not emphasized in the short term, long term potential is enhanced by strengthening the local industries. A modernizing Guatemalan dairy industry will also provide opportunities for U.S. genetics exports. Guatemala's milk supply can be improved by adopting the following suggestions:

- provide training to dairy farmers on increasing milk production and understanding genetic information with a model farm or training center;
- promote price policies which give producers incentive to provide higher quality, clean, and safe milk to processors and end users;
- encourage processors and distributors to use refrigeration when transporting milk from the farm to the processing plant;
- provide training to cheese makers and milk processors on improving efficiencies, taste, quality control, etc.;
- establish a clearing house for processors to source materials, machinery and technical information would benefit them greatly (it is important that the staff in this center are bilingual and that they are aware of the needs of the smaller processors);
- provide training to sales managers on PR, advertisement, point-of-purchase displays, in-store promotions, coupons, etc. to increase sales;
- encourage U.S. suppliers to develop contacts for dairy ingredients and powdered milk replacers;
- encourage promotion and introductory specials for U.S. dairy products through Paiz, the largest supermarket.
- processors need to promote the steps taken or commitment to improving product quality and taste in their marketing efforts;
- provide teaching tools for the proper preservation of feedstuffs looking at alternatives like Ag-Bag or plastic wrapped bales which can be easily transported from field-to-farm or farm-to-farm;
- assist farmers in learning about genetic selection record keeping and identification systems;
- Develop youth programs to involve young men and women in agriculture.



### **Specific Recommendations to Achieve Goals**

1. A U.S. milk processing expert should return to Guatemala to conduct seminars for cheesemakers and to work directly with select dairy processing facilities such as Monte Maria, Lacteos Xelac, Parma, and La Palma. Focus should be given on Queso Fresco, Mozzarella, Cheddar and American cheese. Emphasis should be on ensuring product quality, consistency, as well as improving plant efficiency and product taste.
2. Guatemalan cheese makers or plant managers should travel to the U.S. for training in comparable plants.
3. Invite representatives of dairy processing facilities that are expanding and buying equipment to the U.S. Itineraries may be arranged by state departments of agriculture (SDA's) to introduce buyers to U.S. food processing and packaging equipment companies (reverse buyers mission). These same companies are sourcing food ingredients from the U.S. and meetings with potential suppliers may be arranged by U.S. Dairy Export Council (USDEC) and/or SDA's.
4. A U.S. advertising/PR expert should give seminars in Guatemala to milk processors and retailers on how to develop a marketing plan, PR campaign, in-store promotions, point-of-purchase materials, etc. in order to promote product consumption.
5. Training programs modeled after those coordinated by USDEC in Mexico would be beneficial: "Distributor Certification Courses" with USDEC staff, university extension and local milk processors give attendees instruction on the proper handling of dairy products to ensure high quality. Temperature and quality control throughout the distribution chain are emphasized. Courses could be held in Guatemala City, Quetzaltenango and El Salvador.
6. Survey supermarkets, importers and consumers to determine consumption trends and buying patterns for dairy products. This information would be useful for milk processors and potential U.S. exporters.
7. Plan a seminar series or short course with slides, or videos that can be used as training materials for a wide variety of management and genetic topics. These can be offered on a regional basis with fees underwritten by a sponsor or a financial aid program.

### **Best Prospects for U.S. Exports**

- dairy genetics: live cattle, semen
- milk replacers
- milk cooling tanks (used)
- milking equipment, new and used
- food processing and packaging equipment (used)
- dairy ingredients:
  - whole milk powder, cheese, butter, whey.

**VII. KEY CONTACTS VISITED IN GUATEMALA**  
**(copies of business cards attached)**

1. Lic. Oscar Sanchez M., General Manager, Pops Heladeria Guatemalteca, S.A.. Pops is the largest processor of ice cream in Guatemala with 25% of the market share. Pops imports many of their flavorings and ingredients from the U.S. as well as some powdered milk from New Zealand.
2. Ing. Agr. Fernando Navas, Fundenca. Mr. Navas traveled with our team as an interpreter. Mr. Naval has extensive knowledge of the country's dairy and agricultural industries. He is setting up a government-sponsored dairy operation and is looking to import 250 U.S. Holsteins.
3. Juan Carlos Fumagalli, General Manager, and Jonathan Guzman, Dairy Farm Manager represent Monte Maria, S.A. A holding company owns this dairy operation and processing facility and is making investments to increase production. The dairy herd is projected to increase to 1000 head from its 350 head by importing cattle from the U.S. There are also plans to remodel and expand the dairy processing plant.
4. Jorge Quesada, General Manager and Craig Wilson, Director of the Ingredients Division of New Zealand Milk Products (Guatemala), S.A.. This office is the Central American headquarters for the New Zealand Dairy Board and is responsible for marketing NZ exports in the region.
5. Lic. Nery Aldana, General Manager, La Palma. This milk processor of fluid milk, cheese and cream, also imports juice concentrates from the U.S. La Palma recently purchased used storage tanks from the U.S. and is planning on buying more.
6. Jose Alberto de Paz, General Manager, Lacteos Xelac. This is a dairy cooperative with more than 60 members who make European style cheeses.
7. Erick E. Archila Dehesa, Director of Operations, Carlos E. Figueroa, Manager of Sales & Distribution, and Paulino A. Diaz, Administrator, Foremost Dairies de Guatemala, S.A.. This company makes ice cream novelties, cheese, cream, fluid milk and bottled fruit juices.



MORE CONTACTS IN GUATEMALA

**U.S. Embassy**

Richard Todd Drennan, Ag Attache  
U.S. Embassy - Guatemala, Unit 3305  
USDA / FAS  
APO AA 34024-3305

Tel. (502) 2 311541, Ext. 300  
Fax (502) 2 318293

Victor M. Aguilar, Ag Specialist  
U.S. Embassy - Guatemala, Unit 3305  
USDA / FAS  
APO AA 34024-3305

Tel. (502) 2 324030  
Fax (502) 2 318293

**Industry Contacts**

Ing. Agr. Edgar Fernando Navas Galveg  
Fca. Barcena Villa Nueva  
Guatemala City, Guatemala

President of the  
national  
agricultural school.

Tel. (502) 2 0311092  
Fax (502) 2 0311092

Hector O. Andrade P.  
Executive Secretary  
Consejo Nacional de Fomento Lechero  
Km. 22 Al Pacifico  
Barcenas, Villa Nueva  
Guatemala City, Guatemala

Directs a program to  
bring technology to  
the farmers. Plans  
include 7000 farms.  
Funding from UN &  
FAO

Tel. (502) 2 031014  
Fax (502) 2 031012

Victor M. Aguilar A. D.V.M.  
Hacienda Los Patos  
Avenida 17-29, Zona 10  
Guatemala City, Guatemala

Former head of the 15  
college of veterinary  
medicine. Active in the  
cattleman's association.

Tel. (502) 2 680061

Dr. Francisco Rodar  
Distrivet  
Via 2, 4-34, Zona 44  
Guatemala City, Guatemala

Consultant,  
distributor for  
NOBA and Surge  
equipment

Tel. (502) 2 326831  
Fax (502) 2 344731

Jose Alberto de Paz, General Manager  
Lacteos Xelac  
Km. 189 y medio  
San Cristobal, Totonicapan  
Guatemala

GM of processing plant  
making cheese,  
yogurt etc. Good  
contacts with producers.

Tel. (502) 639503  
Fax (502) 639681

Adan R. Soto  
Finca Veracruz  
6a. Calle 12-32, Zona 1  
Quetzaltenango, Guatemala

Jersey breeder for 50 yrs  
Founding member of the  
Jersey Association.

Tel. (502) 612186  
Fax (502) 630726

Mark Bressani, Manager  
Productos Lacteos PARMA  
19 Calle 10-54, Zona 10  
Guatemala City, Guatemala

Manages progressive and  
well run processing plant  
Has top Jersey herd with  
excellent management

Tel. (502) 2 370428

Juan Carlos Fumagalli, General Manager  
Jonathan Guzman, Herd Manager  
Monte Maria, S.A.  
Anillo Periferico 17-36, Zona 11  
01011 Guatemala City, Guatemala

Key farm personnel in the  
large diversified Monte  
Maria farming venture.  
Distributors for many  
products.

Tel. (502) 2 731453 -59  
Fax (502) 2 7326111



Carlos & Mauricio Estrada Nicol

Megalac

6a. Calle 1-36, Zona 10

Ed. Valsari of. 503

Guatemala City, Guatemala

Two of six brothers in a  
new farm and processing  
plant. Plan to open some  
frozen yogurt franchises.

Tel. (502) 2 316818

Fax (502) 2 314613

## VIII. EL SALVADOR OVERVIEW

### A. DAIRY GENETICS IN EL SALVADOR

#### Overview

Our assessment team moved to El Salvador after five days in Guatemala. Some of what we saw during the second week was very similar to the industry we had seen in Guatemala, but there were stark contrasts, too. Perhaps the single most important difference was the role that was taken by the producer group PROLECHE in El Salvador. With a recent management change PROLECHE had doubled the number of producers who were members and had become very active in trying to protect the dairy farmer from legislative matters which would be detrimental to the industry. In addition to government issues, the organization has taken a very proactive role in working directly with the producer by providing management information and new information on basic technologies.

Although the team did not reach quite as wide an economic cross section in El Salvador as in Guatemala, they did observe dairy farmers in El Salvador who employed a business-like approach to management and who were eager to adopt new ideas and find new and better ways to solve problems.

In El Salvador the farms we visited had a stronger tendency to have segregated their enterprises into milk-specific operations. Although we saw plenty of Brahman and Zebu based cattle along the roadside, we saw less and less of them in the milking corrals. We observed greater use of the Australian Friesian Sahiwal within dairy herds to provide heat and tick resistance to the cattle. El Salvadorans still maintain some "long ear" blood in their cattle, but at a lower percentage than we saw in the milking cows in the dual purpose herds in Guatemala.

Perhaps one of the reasons herds with high-percentage and full-blood North American breeds are successful in El Salvador is the growing use of cooling systems on the farms. More and more cows are being held in confinement during the hot daytime hours and cooled with misters or a combination of misters and fans. Not surprisingly, quoted production averages were higher.



## **Breeds & Breed Associations**

The Holstein cow was heavily preferred in the herds we visited. With a bit more technology and willingness to adopt technology, the farm community in El Salvador seemed more comfortable managing the high-producing Holstein and seriously investing in cooling apparatus. We visited one herd of Holsteins where the cows were moved into a cooling pen every 30 minutes during the hot part of the day. This solution to one problem may create another by causing excessive herd movement, decreasing needed resting periods.

Our itinerary included one herd of purebred Jerseys, whose owner was unable to meet with us due to an emergency. The cows appeared to be quite productive but stressed in body condition, apparently related to high milk production rates. The farm was in the process of upgrading their cow comfort efforts which should have a direct impact on production. We witnessed limited Jersey influence in other herds and, as expected, the owners are looking for more daily production but admire the efficiency of the Jersey cows.

Brown Swiss have been on the decline in the country as most of the cows with Swiss characteristics seemed to be older cows. A true Swiss breeder would say it is the Brown Swiss influence that allows them to get old. The owners like the traits exhibited by the Brown Swiss but, as with Jerseys, in comparison with the Holstein most felt that total production was lower than they needed. Most milk is paid on a volume basis with some plants paying a butterfat bonus. Protein premiums are not standard even though much of the milk is processed into cheese.

We did visit one herd with some Guernsey cows. The owner was pleased with their performance, but was not increasing his Guernsey population nor was he using Guernsey bulls in crossbreeding to incorporate their characteristics into the rest of his herd.

Many herds we visited are following a purebred breeding pattern and do not seem as concerned to have a significant percentage of Brahman blood in the milk cows.

We did not meet with representatives of specific breed associations, but came away with the feeling that PROLECHE may be one of the more valuable group's making technical information inroads by reaching the producers directly.

## **Genetic Selection**

More and more cows are milked by machine and in milking parlors in El Salvador. Attention to functional type traits will become more important as machine milking and production escalate. Priorities for sire selection seem to be centered around calving ease, production and feet and legs.

We were not surprised to see that outside consultants make the genetic selections and individual matings for many of the herds. Many of the people doing the selection are also representatives of the semen companies supplying the genetics. Some concern was expressed about the genetic progress that was being sacrificed by using older, cheaper bulls with more profit margin to the distributor, rather than current bulls from the top of the genetic rankings or even lower-priced sample (unproven) bulls that represent the "new generation" within each breed.

### **Artificial Insemination**

El Salvador has a relatively high use of A.I. in the dairy herd, but we found no conclusive statistics to indicate what the percentage might be. Some herds were 100% A.I. bred. Heat detection techniques, such as tail chalking, assist in the maintenance of acceptable pregnancy rates and better return on investment for semen. Breeders are also clever in using the best genetics on virgin heifers where conception rates are higher and the genetic level is already one step ahead of the older cows.

Many of the top herds were decimated during the 12 year civil war within the country. Cows were killed or butchered at random by opposition factions curtailing the genetic progress which had been made in the 70's. Herds are just now getting back on solid footing where they can expand and improve.

### **Resources**

The dairy community in El Salvador is in need of some financial relief from high fixed interest rates, and high duties on imported feeds and equipment. One dairy farmer had borrowed nearly \$60,000 for milking equipment and was paying 20% interest on a three year loan (inflation was about half that). He is unable to refinance at today's slightly lower rate and certainly could not find a buyer at those terms.

Bankers are reluctant to lend to the dairy industry as they find other industries have a faster payback and lower risk. The GSM-102 and 103 programs would work well as dairy groups are interested in increasing production and improving genetic potential. These groups are strongly opposed to intervention from their government as their recent experiences have not been all that positive. They would like to find a private source of funds for investment in growth of their businesses. We met with a group of farmers representing four districts wanting to build a regional processing plant. Internally they have not been able to get the financing they need with reasonable terms on the money.

Currently, there seems to be little interest in large-scale dairy shows in the sense we perceive them in the U.S. There are,



however, many local fairs with cattle on exhibit. The numbers of cattle on display were way down for the one fair we attended; however, there were attractive exhibits of machinery and dairy accessory items.

### **Technology**

Seminars or symposia on management, nutrition, forage handling, marketing and genetics would appear to create strong interest and attendance. Topics could range from calf raising, to mastitis management, to dry cow nutrition and many other topics.

We noticed that progressive farmers were starting to make corn silage for the first time. Most have had only one year or less experience. Most silage bunkers were relatively flat (low) and spread out. This extra surface area increases spoilage and reduces important compaction. The resulting product reflected this problem. Close inspection of the silage showed no grains or cob. The ears had been harvested for human consumption as the price of corn was high at this time. We couldn't be sure of the economic exchange but it appears that the ears would have enhanced the feed value of the silage sufficiently and reduced the need to purchase costly concentrates to offset the income from the corn and the extra labor to harvest it separately.

We visited a number of farms which had refined certain parts of their management very well. These locations could serve as valuable teaching herds bringing the added authenticity of experience within their own country. Sr. Castaneda, the General Manager of PROLECHE was starting to incorporate some of these success stories into their member magazine *Ganadero Salvadoreno*. This publication along with *Hoard's Dairyman* (Spanish Edition) seem to be the respected chronicles for the dairy industry.

### **Embryo Transfer**

Although the team discussed embryo transfer and other more advanced genetic engineering applications with only a single herd owner and his veterinarian, it appears that El Salvador is not ready for advanced technologies such as embryo transfer on a commercial basis. There may be a select few who are qualified to learn these techniques by training in the U.S., but commercial application will be limited for some time. Direct thaw (transfer) embryos will be a good stepping stone and cut out some of the precise handling necessary with the traditional process.

## **B. DAIRY PRODUCTION IN EL SALVADOR**

The on-farm dairy technology in El Salvador appeared to be more progressive than that observed in Guatemala. Here, owners were expanding and improving some aspects of their farms at rapid rates. Interest in cooperatives and marketing groups is higher than in Guatemala.

The PROLECHE dairy farmers association appeared to have done the most to benefit its members. Their focus on technical assistance, teaching basic skills and working for an improved financial status for the owners was evident across the country. Currently members are working with an advisor from Israel in the areas of nutrition, cow comfort and facility design.

According to Mr. Castaneda, PROLECHE general manager, herd sizes range from five to 1000 head, with many households in the countryside having a single cow. Nearly three quarters of the cows are in herds which average 40 cows. Hand milking dominates, but is rapidly being replaced by machine milking.

### **Facilities**

Housing and milking facilities vary widely in El Salvador. Construction was often determined by the access to shade or slope for drainage. Some preferred individual stalls for the cows, while others had a loose housing (community) arrangement.

There is a significant amount of European equipment in the milking facilities. A double-three side opening parlor with Fullwood equipment connected to a computer was easily the most advanced system. At a cost of the equivalent of \$10,000 per milking stall, the facility was under-utilized with 80 cows.

One of the most cost efficient systems was a rapid (front) exit flat barn using 10 machines. Cow flow was good and yet individual care could be given to each animal. A popular "starter" unit was a portable vacuum pump with two bucket milkers, much like we might see as a temporary milker for a show string. This handy unit from Alfa-Laval was seen on display at a local fair costing U.S. \$6834, about double what similar equipment would sell for in the U.S.

It may be most accurate and fair to say that the progressive dairy farmers in El Salvador are "in transition." For example, we would see a new milking parlor with housing and feeding facilities in need of upgrading. On another farm we saw a new high roof, open-gabled, free-stall barn coupled with hand milking (no electricity) and very marginal cow hygiene.

A number of farms had installed cooling misters and fans to reduce heat stress, yet had inadequate places for cows to rest, feed bunks



in direct sun or swampy areas where cows congregated. Milking procedures often left room for milk contamination from feed mixing nearby. We also observed failure to use milk strainers and carrying milk from the milking area to cans or tanks in uncovered, hard to sanitize vessels. Cows were often seen laying in the holding or preparation area, increasing the likelihood of dirty, wet cows and mastitis incidence.

We also observed evidence of good management practices that had been adopted. We saw the best silage system at Rancho Irene, with high bunkers, excellent cut (particle size), excellent compaction, functional drainage and a feed saving technique for removing silage. Estimated spoilage here was less than 3%, and equally important, the spoiled feed was removed rather than mixing it in with the good. Feed quality was very high to the point that other farmers were buying silage from this farm. They were even going to include the ears in the next harvest. It makes good sense for one farmer with good equipment to harvest and store silage for others, rather than have several farmers do a marginal job.

Calf and heifer care are of critical importance if herd improvement is to be optimized. Many calves seem to be housed in hutches or individual pens. The best we saw had shade on the front and back with open sides, allowing good ventilation. More frequent access to fresh water was a suggestion we offered to the interested calf raisers. From the hutches the calves moved into group pens, sorted by size. Most appeared to be gaining weight and free of the typical symptoms of runny eyes, noses and hacking coughs.

## **Feeding**

Many of the dairy farmers in El Salvador have adopted some valuable nutrition practices. These farms were feeding protected fats in their grain rations which give the cow more energy, very critical in a hot climate. Their use of by-product feeds such as peanut paste made the feeds more palatable and helped increase dry matter intake while keeping costs under control.

We were quite surprised at the feeding level of the grain concentrate. Some fed at a rate of one pound for every 2.2 lbs, of milk. Some fed at a higher rate with one pound for every bottle of milk (750 ml or 1.65 lbs.) produced per day. This high level of concentrate feeding may be necessary, in part, due to the marginal feed value in the forages coupled with the added stress from heat. Ideally, more of the total nutrients would come from less costly fresh forage, hay or silage. A local feed mill could aid in providing cost-effective feed supplements, maximizing by-product utilization and cost savings from volume or contract purchases.

The available pasture land appeared to be high quality with proper drainage, texture and good fertility. Crop rotations are being used by some farms to replenish the soils. We saw some quality, picturesque pastures with neatly trimmed hedge rows for fencing. In order to gain maximum utility from these pastures owners need to increase the stocking rate or cut down the acreage available for grazing. The extra acreage could be used for hay or other cash crops. We must note that we were not there during the dry season and may be premature in assessing management for that time of the year. Making hay in the rainy season would be difficult with daily showers. There may be some opportunity to make some hay during the transition period from wet to dry seasons.

### **Breeding**

Reproductive efficiency is where the greatest improvement can be made that will directly increase profitability for the herd owner. Considering the levels of milk production currently achieved, the herd cannot afford to average 200+ days open (days the cow is not pregnant after her preceding calf). They should set goals for 100 or less days, with top herds able to achieve under 90 days.

We routinely heard of four services (inseminations) per conception. This is double what is expected in a closely managed herd. Some factors that may influence this rate may be nutritional. Cows may be in a negative energy balance (using more than they take in) or may have imbalances of minerals and micro-nutrients. It is as important to avoid chemical or mineral toxicity as it is not to incur nutritional shortages. Some of the key factors to watch are vitamin content of the feed, along with selenium, zinc, cobalt, copper plus the more recognized calcium and phosphorous.

Breeding problems may be secondary symptoms from other problems the cow may have experienced. Retained placentas and related endometritis will delay conception, sometimes for months. Are cows going cystic (not cycling) from nutritional or stress related factors? Excessive movement of the cow can influence conception rates. No one can argue with the effort to cool the cows. It may be far better to try to cool the eating and resting (cud chewing) areas to encourage the cow to spend as much time at these two activities as possible and not so much time travelling to a separate cooling unit.

Time spent in the waiting area to be milked three, four or even six times per day may have some long-term detrimental effects on the cow. Milking frequency of six-times per day is unprecedented, except in Israel. Our production expert finds that a cow will give some extra milk, but may put herself into a negative energy balance before she adjusts her feed intake to compensate for the added requirements to her system. It would be interesting to plot lactation curves (production persistency) in the cows with higher



than two times per day milking. The basic question is: Are the benefits from the added milkings more than the immediate and long term costs?

### **Health Care Supplies**

We saw more utilization of on-farm health care treatment of the cows in El Salvador. Many of the pharmaceutical produced by U.S. companies are used widely in the dairy industry in El Salvador. An immediate observation was the need for education on the use and storage of the products. Proper storage, including refrigeration when suggested, will increase the effectiveness of the product and reduce incidence of contamination or misuse. Expiration dates, dosage and storage are key factors in getting your money's worth from health care supplies.

**C. DAIRY PROCESSING - Observations**

**Raw Milk**

Raw milk quality is often poor, although there are several producers that are seriously trying to improve milk quality. There are efforts being made to increase the use of on-farm refrigeration. Several processors are assisting producers with the installation and financing of on-farm cooling units. The use of hydrogen peroxide in the milk is illegal, and milk is routinely tested for it. Press releases concerning its use adversely affected milk consumption.

Israeli advisors are providing assistance to producers. Five regional extension specialists are trying to help dairymen improve milk production on the farm. There is keen interest by farmers to improve production, and several associations and cooperatives have been formed. PROLECHE is one organization that spent considerable time showing our team dairy production and processing facilities.

In San Miguel, AGUES, a group of 46 dairymen with a production of 14,000 liters per day met with the team. They were interested in establishing a milk processing facility. They were very concerned over the importation of powdered milk from the U.S., fearing that these imports will erode their production base.

**Processed Milk**

All the plants that were visited are upgrading and remodeling in an effort to improve efficiencies and quality. In addition, all plants are trying to improve milk pick-up methods and delivery schedules. Milk quality testing is emphasized, and one plant pays premiums for high quality milk. The need for on-farm refrigeration is recognized, but obtaining funding to purchase equipment is difficult. One processor is financing the installation of on-farm cooling tanks. Although there are some over-the-road tankers, milk is still delivered in 35-50 gallon plastic barrels, by flat bed or pick-up trucks.

Plants visited are all multi-function plants producing a wide variety of products such as fluid milk, ice cream, cheese and juices. Milk is packaged in 1 liter form fill and seal bags, Brick Packs, blow-molded bottles and paper cartons. Some very modern equipment is installed in a few plants. Potential for UHT and aseptic packaging is recognized, and components have been installed. Laws requiring all milk to be pasteurized have been passed, however, enforcement of the law is suspended for two years.



Products we observed and evaluated are very similar to products found in the U.S. with respect to flavor, composition and quality. The dairy plants that we visited are very progressive and using modern equipment and techniques. Many Salvadorans have contact with dairy processors and products in the U.S., Canada, and the EU and believe the products in El Salvador reflect this exposure.

### **Cheese**

The only cheese plants that we visited are making mostly fresh white cheeses. There are at least three plants making cheese varieties other than the queso fresco type, but we were unable to visit them. Evaluation of their products purchased at retail outlets indicate that good hard cheeses are being produced by all of them. Consumer loyalty to these products appears to be strong. Dairy displays in supermarkets are very large and are stocked by representatives of the individual dairy processors. There is a considerable amount of imported products, as well as extensive representation of locally produced cheeses.

A fresh white cheese with a very soft creamy texture is the most popular cheese. This cheese is used extensively in pupusas, which is a traditional dish. There is a great concern by processors about cheese entering the country illegally. Apparently large amounts of white Hispanic cheeses from elsewhere in Central America are entering across the border.

### **Butter**

There is very little butter being made in El Salvador. The majority of butter sold in the market and food service sector is imported from New Zealand. Excess milkfat is sold as fresh cream and is typically packaged in plastic bags. Fat percentage of this cream was seldom stated, but ranged from 25% to 40%.

### **Frozen Desserts**

Competition among frozen dessert producers is fierce. Billboard advertising and ice cream shops are located widely throughout San Salvador and on major roads. All the frozen desserts sampled are high quality products. Several U.S. companies are present in this niche, and prices of local product are comparable to those in the U.S. The majority of the ingredients, other than milk and milkfat and powdered milk, are obtained from suppliers in the U.S.

**D. DAIRY MARKETING - Observations**

The supermarket distribution sector comprises about 25% of the market for dairy product sales and is growing. The remaining 75% of dairy product sales is attributed to small stores and direct sales from the farm. There are about five or six supermarket chains in El Salvador that dominate the market. Because of the competition among these supermarkets, they are able to provide more diversity in products. Many of the urban supermarkets are modern, clean, and developed to provide convenience to the customers. For instance, they are located in shopping malls or shopping centers. Some house banks, liquor stores, ice cream shops, film processing, stationery, kitchen accessories, etc. under the same roof as the food retailing. The U.S. style supermarkets seem to be successful in El Salvador and were busy during our visits.

The USDA Agricultural Affairs Office coordinated an American Foods in-store promotion which was being held in a supermarket chain during the dates of our visit. Five similar U.S. in-store promotions took place last year. These promotions are well received by consumers and stores.

There is a demand for safe, quality dairy products in El Salvador and it is being largely met by the local processors. Kraft is the leading imported cheese supplier and Dos Pinos of Costa Rica leads the UHT market segment. Up to seven different powdered milk suppliers fill the supermarket shelves: Nestle (made in Honduras); Dos Pinos (Costa Rica); Gold Star (Ireland, packaged in El Salvador); Denmark; Holland; Borden (made in Panama); Canada; New Zealand; and the U.S. (Carnation). The packaged powdered milk market sold in retail outlets is saturated with competing products from around the world.

Salvadoran dairy processors are required to hire someone to stock the shelves in the supermarkets with their respective products. This is an added expense for local dairy companies, but if done properly, assures that they have attractive displays in the store which is replenished frequently. Many supermarkets import directly, and, in these cases, they are responsible for restocking the display cases.

The amount of advertising among local dairy processors is impressive. There are many billboards and signs at bus stops, etc. promoting brands of dairy products. A generic effort to promote dairy consumption is not evident, however, this has been discussed among some processors.

U.S. products have an image of quality. Salvadoran companies have even used this perception of U.S. quality by using English names or



words on their own food packaging. For example, a Salvadoran company is marketing their yogurt using the brand name "Yes". Most U.S. products found on store shelves are private label brands or generic products, all labeled in English. A law is being introduced which will require imported products to have ingredients printed in Spanish. Kraft will use stickers with the ingredients in Spanish, but will keep the rest of the label in English.

New Zealand is also playing on the image of U.S. quality by marketing NZ made cheese with the brand name "American Colby". They are also selling "Spain Manchego" and "South Holland Gouda".

U.S. fast food franchises are present in the market and are stimulating the demand for U.S.-style cheese such as Mozzarella, cheddar and processed American slices. Fast food restaurants are growing. The following restaurant chains are prevalent in San Salvador: McDonald's, Burger King, Wendy's, Chili's, Pizza Hut, and I Can't Believe It's Yogurt. Processed American cheese slices, cheddar and Mozzarella comprise large portions of the refrigerated cheese sections in supermarkets in upscale neighborhoods.

The majority of Salvadoran consumers buy cheese and dairy products based on price rather than quality even if they know U.S. products are higher quality. The majority of cheese consumed is Hispanic queso fresco, and soft, fresh cheeses.

## **IX. CONCLUSIONS- EL SALVADOR**

- Some Salvadoran milk processors are taking the following steps to ensure a reliable, quality local milk supply: 1) arranging financing/purchase of milk cooling tanks installed on farms of their suppliers; 2) using refrigerated trucks to pick up milk at farms and deliver to the plants; and 3) using pasteurization.
- Dairy co-operatives are opposed to imports of powdered milk for reconstitution in milk processing. They fear that this will replace their market for fresh fluid milk. They are in favor of raising the tariff on imported powdered milk above the current 20% level to protect their market share.
- The potential for U.S. exports of new and used plate coolers, milk handling equipment, and milk processing and packaging equipment is very good.
- There is a limited niche for high-end U.S. specialty cheese, cheddar, mozzarella, processed cheese slices, etc.. Many Salvadorans travel to the U.S. or watch U.S. TV programs and appreciate U.S. foods and lifestyle.
- Feed intake and cow comfort need to be improved to expect an increase in national milk production levels. Better utilization and placement of cooling systems will result in greater efficiency, less wasted power and water and less movement and stress to cows.
- Dairy farmers should learn to be a larger part of the genetic selection process by understanding the information in sire proofs and advertisements. Herd owners should start to include type traits and milk components into their genetic selection criteria. More accurate and visible animal identification using freeze brands or ear tags will assist in identifying the better production animals in the herds. Permanent identification and marking is essential to genetic improvement in the future.
- Training facilities are insufficient to train the managers necessary for high production dairy operations. Seminars, short courses or training videos on calf raising, vaccinations, herd health, heat detection and milking procedures would be valuable additions to limited-availability dairy management publications.
- Increased use of tropically-adapted legumes would improve feed values and reduce the need for nitrogen fertilizers. More strict pasture management and rotation would improve yields and profits, reducing reliance on higher cost concentrates. A centralized feed mill would help control feed costs and control nutrition levels.
- Producers and processors should work closely together to promote dairy product consumption and improve fresh dairy products' image.



## X. RECOMMENDATIONS- EL SALVADOR

USDA/FAS should provide technical assistance to help ensure that Salvadoran milk processors and end users have a reliable, quality milk supply and safe finished products. This will fill the growing demand for dairy products and expand the market for U.S. exports (including dairy genetics) in the long run. El Salvador's milk and dairy product supply can be improved by adopting the following suggestions:

- Provide processors with training on improving their efficiencies as well as introducing techniques used in the U.S. There is a lack of dairy processing literature published in Spanish and European and Israeli contacts are already working to meet this need.
- A clearing house for processors to source materials, machinery and technical information would benefit them greatly. It is important that clearing house staff are bilingual and that they are aware of the needs of the smaller processors.
- Contacts with U.S. processors should be established to share technical information.
- U.S. producers of specialty or processed dairy products should establish relationships with the major supermarkets to gain access to shelf space in their stores.
- Manufacturers of milk replacer might establish a distribution network through farmer cooperatives, giving farmers more milk to sell into the local retail market.
- Provide training to farmers to increase milk production through better nutrition, cow care and genetic selection.
- Provide a dairy records system that can be used to keep herd health, identification and production data. This data base will be useful later on when production testing begins and herd records are included in pedigree information.
- Encourage use of proven feed storage systems such as Ag-Bag, or plastic wrapped bales to decrease feed loss and increase feed quality.
- Explore the possibility of El Salvador qualifying for Cochran Fellowships or other training programs to study agriculture and dairy science in the U.S., either through short courses or on-farm training programs.

### **Specific Recommendations to Achieve Goals**

1. Conduct training seminars, taught by a U.S. milk processing expert, in El Salvador for dairy processors, plant managers and cheesemakers to improve their efficiencies and maximize quality control. Salvadoran processors should include Foremost Dairies, Salud and other small dairy processors interested in learning U.S. technologies. Emphasis should be on assuring product quality and consistency for the following varieties: Queso Fresco, Mozzarella, Cheddar and American cheese.
2. Invite select Salvadoran plant managers and/or cheesemakers to visit comparable plants in the U.S. as a follow up to in-country training,
3. Invite to the U.S., managers of dairy processing facilities that are expanding and are buying equipment. Itineraries may be arranged by state departments of agriculture (SDA's) so that buyers are introduced to U.S. food processing and packaging equipment companies (reverse buyers mission). These same companies are sourcing food ingredients from the U.S. and meetings with potential suppliers may be arranged via U.S. Dairy Export Council (USDEC), U.S. Livestock Genetics Export, Inc. or SDA's.
4. Provide information on the GSM-103 and supplier credit programs to key farmers and dairy processors who express an interest in expanding. Affordable loans are needed to finance technology and production improvements.
5. Offer training programs modeled after those coordinated by USDEC in Mexico to Salvadorans. For example, in the "Distributor Certification Course" USDEC staff, university extension and local milk processors give attendees instruction on proper handling of dairy products to ensure high quality. Temperature and quality control throughout the distribution chain are emphasized. Courses could be held in San Salvador and Sonsonate.
6. Survey supermarkets, importers and consumers to determine consumption trends and buying patterns of dairy products. This information would be useful for milk processors and potential U.S. exporters.

### **Best Prospects for U.S. Exports**

- dairy genetics: live cattle, semen
- milk cooling tanks, milking machines (used)
- dairy processing equipment (used)
- specialty cheeses, powdered milk replacers for livestock



**XI. KEY CONTACTS VISITED IN EL SALVADOR**

1. Miguel Angel Castaneda, General Manager, PROLECHE. PROLECHE is a cooperative of dairy producers who are working together with common goals, i.e. increase production, lobby the government for higher import duties on milk powder, etc.
2. Vicente Armando Canales, General Manager, Cooperativa Ganadera Sonsonate de RL. This cooperative makes a line of quality dairy products including fresh milk, cheese, cream and juices.
3. Eduardo B. Portillo Castaneda, Sales Manager, Empresas Lacteas Foremost, SA de CV. Foremost is a leading dairy processor with a range of dairy products.
4. Jose Roberto Castillo, General Manager, Dairy Internacional de El Salvador, SA de CV.
5. Carlos Arturo Muyshondt, President, Asociacion de Agricultores y Ganaderos Centro Americanos
6. Jose Adalberto Chorro R., Sales Manager, Kraft Foods. The Kraft subsidiary is responsible for handling the importation and distribution of Kraft products.
7. Norma L. de Escobar, General Submanager, Banco Salvadoreno. This bank has experience using the GSM-102 program and is interested in working with livestock importers and other agricultural companies.
8. Christopher Lynch, American Embassy, Department of Commerce. Mr. Lynch gave us a briefing on the economic situation in El Salvador.

**OTHER CONTACTS IN EL SALVADOR**

**U.S. Embassy**

Richard Todd Drennan, Ag Attache  
U.S. Embassy - El Salvador - Agriculture  
USDA / FAS  
APO AA 34023  
Tel. (503) 390 1666  
Fax (503) 2 703351

Miguel Fabio Herrera, Ag Specialist  
U.S. Embassy - El Salvador  
USDA / FAS  
APO AA 34023

Tel. (503) 360 1666  
Fax (503) 2 703351

Christopher F. Lynch, Economic Counselor  
U.S. Embassy - El Salvador  
Final Blvd., Santa Elena  
Antiguo Cuscatlan  
El Salvador

Tel. (502) 278 4444  
Fax (502) 298 2336

### Industry Contacts

Miguel Angel Castaneda, General Manager  
PROLECHE  
Autopista Sur frente a Suc.  
Banco Hipotecario  
San Salvador, El Salvador

GM of the assoc. of  
dairy producers. Has  
many progressive  
ideas.

Tel. (503) 243 3813  
Fax (503) 243 3810

Ing. Jose Roberto Castillo P.  
Hacienda El Milagro  
Calle del Cantabrico 20-A  
Col. Jardines de Guadalupe  
Antiguo Cuscatlan, La Libertad  
El Salvador

Dairy farmer, equipment  
dealer. President of  
PROLECHE.

Tel. (503) 243 4819  
Fax (503) 243 2186

Santiago Arnaldo Perla  
Residencial Los Pinos, Pje  
Bou 1-10  
San Miguel, El Salvador

Farmer and member of the  
national legislature.  
President of farm group  
wanting to build  
processing plant.  
"Modern" farm

Tel. (503) 661 1742  
Fax (503) 661 3434

Jose Antonio Longhares, General Manager  
El Jobo  
Km. 69 Carretera Acajutla  
Sonsonate, El Salvador

Manager of workers coop with  
dairy herd and processing.  
Farm was the start of the  
agrarian reform movement.

Tel. (503) 51 0773



Ing. Vicente Armando Canales  
General Manager

Cooperativa Ganadera de Sonsonate de R.L.  
Carretera y Acajutla  
Sonsonate, El Salvador

Tel. (503) 51 0353  
Fax (503) 21 0349

Plant manager for  
local dairy processing plant.  
One of the top plants, good  
products.

Pedro Martinez  
Carretera Litoral  
Desvio a Puerto Parada  
Usulután, El Salvador

Tel. (503) 662 1756  
Tel. (503) 662 0560 (home)

Dairy farm owner on the coast  
wants to import 100 Holsteins.  
Director of PROLECHE and very  
active in formation of the  
group wanting to build own  
processing plant.

Gustavo Alfonso Escobar  
Calle Los Castanos #86  
Casa #3, Col. Sn. Francis  
San Salvador, El Salvador

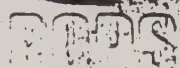
Fax (503) 223 6871

Dairy farm outside of city has  
new milk parlor and computer  
system installed. Director  
of PROLECHE.

Dr. Roberto E. Castaneda, DVM  
Genetica Ganadera, S.A. de C.V.  
1a. Calle poniente y  
51 Avenida Norte No. 186  
Apartado 06-790  
San Salvador, El Salvador

Tel. (503) 23 4523  
Fax (503) 23 4523

Semen importer for Sire Power,  
Select Sires, also vet supply.  
Does herd consulting plus  
clinical vet work on farms.



**HELADERA  
GUATEMALTECA, S. A.**

**LIC. OSCAR SANCHEZ M.**  
Gerente General

Av. Las Américas 6-00, Zona 13  
Guatemala, C. A.  
Teléfonos: 310412 - 346407

FAX: 346341

**FUNDENCA**

FUNDACION PARA EL DESARROLLO DE LA EDUCACION  
EN CIENCIAS AGRICOLAS

**Ing. Agr. Fernando Navas**  
Fundador

4 Avenida 22-52, zona 14  
1er. Nivel, Apto. 2  
Edificio Premier Las Américas

Telefax:  
7 683142



**JUAN CARLOS FUMAGALLI F.**  
Gerente General

*Jonathan  
Guzmán*

**MONTE MARIA, S. A.**

Anillo Periférico 17-36, Zona 11. 01011 Guatemala, C. A.  
Tels: 731453 al 59 y 732601 al 09 Fax: 732611  
San Juan Alotenango, Sacatepequez  
Tels: 0880610, 0880733 y 0880583



**JUAN CARLOS FUMAGALLI F.**  
Gerente General

**MONTE MARIA, S. A.**

Anillo Periférico 17-36, Zona 11. 01011 Guatemala, C. A.  
Tels: 731453 al 59 y 732601 al 09 Fax: 732611  
San Juan Alotenango, Sacatepequez  
Tels: 0880610, 0880733 y 0880583



**New Zealand  
Milk Products  
(Guatemala), S. A.**

REGIONAL OFFICE  
FOR CENTRAL AMERICA  
Avenida Reforma 6-64, Zona 9  
Edificio Plaza Corporativa Reforma  
Torre Jardín  
GUATEMALA, C. A.  
Teléfonos: (502-2) 391021 al 27  
Fax: (502-2) 391019

**Jorge Quesada**  
General Manager



**New Zealand  
Milk Products  
(Guatemala), S. A.**

Avenida Reforma 6-64, Zona 9  
Edificio Plaza Corporativa Reforma  
Torre Jardín  
GUATEMALA, C. A.  
Teléfonos: (502-2) 391021 al 27  
Fax: (502-2) 391019

**Craig J. Wilson**  
Gerente  
División Ingredientes

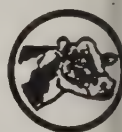


**Lic. Nery Aldana**  
Gerente General

15 Avenida 8-67, Zona 11. Tels.: 711619, 718385, 711622. Fax 710677



**LACTEOS XELAC**



**José Alberto de Paz**  
GERENTE GENERAL

PLANTA Y OFICINA  
Kilómetro 189 y medio  
San Cristóbal Totonicapán

Guatemala, C. A.  
Tel.: 639503  
Fax.: 639681





**FOREMOST DAIRIES DE GUATEMALA, S. A.**

**CARLOS E. FIGUEROA R.**

**GERENTE DE VENTAS Y DISTRIBUCION**

**CALZ. "RAUL AGUILAR BATRES"**

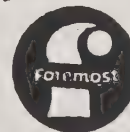
**32-33, ZONA 12**

**TELEX: 5733 FORSA GU**

**GUATEMALA, C. A.**

**TELS: 762178 - 762431**

**FAX: 766262**



**FOREMOST DAIRIES DE GUATEMALA, S. A.**

**ING. ERICK E. ARCHILA DEHESA**  
**GERENTE DE OPERACIONES**

**CALZ. "RAUL AGUILAR BATRES"**

**32-33, ZONA 12**

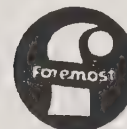
**TELEX: 5733 FORSA GU**

**GUATEMALA, C. A.**

**TELEFONOS:**

**762178 - 762431**

**FAX: 766262**



**FOREMOST DAIRIES DE GUATEMALA, S. A.**

**PAULINO A. DIAZ**  
**GERENTE ADMINISTRATIVO**

**CALZ. "RAUL AGUILAR BATRES"**

**32-33, ZONA 12**

**GUATEMALA, C. A.**

**TELEFONOS:**

**PBX 4-422843 4-762178**

**4-762431 FAX: 4-766262**

ING. VICENTE ARMANDO CANALES  
GERENTE GENERAL

CARRETERA A ACAJUTLA TELEFONOS : 51-1188, 51-0353, FAX : 51-0340  
SANTA TECLA TELEFONO Y FAX : 28-1273



DAIRY INTERNACIONAL DE  
EL SALVADOR, S.A. DE C.V.

*Ing. José Roberto Castillo P.*  
Gerente General

Calle del Cantábrico 20-A, Col. Jardines de Guadalupe  
Antiguo Cuscatlán, La Libertad, El Salvador, C. A.  
Teléfono: 243-4819 Telefax: (503) 243-2186

**SALINSA**  
BALVADOREÑA DE INVERSIÓN INDUSTRIAL, S. A.

CALLE MODELO No. 508  
SAN SALVADOR, EL SALVADOR, C. A.  
TELEFONOS: 270-1282 - 270-1284  
TELEFAX: (0503) 270-1281

*Lic. Carlos Arturo Muyschondt P.*  
PRESIDENTE

COMPAÑÍAS SUBSIDIARIAS  
DIADENA, S.A. DE C.V. - INDUSTRIAL DE ALIMENTOS, S.A. DE C.V.  
DISTRIBUIDORA INDUSTRIAL DE ALIMENTOS, S. A.

José Adalberto Chorro R.  
GERENTE DE MARCA KRAFT FOODS

TABACALERA DE EL SALVADOR, S. A. de C. V.  
69 AV. NORTE, No. 213, COLONIA ESCALÓN  
SAN SALVADOR, EL SALVADOR, C. A.

TELÉFONO: 298-5888  
FAX: 224-3815

ASOCIACION DE PRODUCTORES DE LECHE DE EL SALVADOR

Miguel Angel Castaneda  
GERENTE GENERAL

Oficina Palermo  
Anteplata Sur frente a Sec.  
Banco Hipotecario.  
Tel: 243-3815 Telefax: 243-3818  
San Salvador, El Salvador.



**proleche**



Lic. Eduardo B. Portillo Castañeda  
Gerente de Mercadeo

EMPRESAS LACTEAS FOREMOST, S. A. de C. V.  
Bld. Venezuela No. 2754 - Apdo. Postal 01-3  
San Salvador, El Salvador, C. A.

Teléfonos:  
224-5577 224-5011  
224-5122 223-9144  
Fax: 223-9300

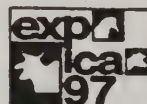


ASOCIACION DE AGRICULTORES Y  
GANADEROS CENTROAMERICANOS

*Carlos Arturo Muyschondt P.*  
PRESIDENTE

Av. Olímpica No. 2008  
San Salvador,  
El Salvador, C. A.

Tels.: (503) 224-5355  
223-8713  
Fax: (503) 223-2747



EXPOSICIÓN PECUARIA DEL ISTMO CENTROAMERICANO  
EL SALVADOR

*Lic. Carlos Arturo Muyschondt*  
PRESIDENTE DEL COMITE PERMANENTE

AV. OLÍMPICA No. 2008, SAN SALVADOR, EL SALVADOR, C. A.  
TELS.: 223-2747 • 223-8713 • 224-5355 • FAX: 223-2747



*Vilma Eugenia Soto de Toledo*  
GERENTE INTERNACIONAL

**BANCO SALVADOREÑO**

Apartado Postal (06)-73  
San Salvador, El Salvador, C.A.

Tel.: (503) 221-3784  
Fax: (503) 222-8232  
Telex: 20172-20382

**CHRISTOPHER F. LYNCH**  
Consejero para Asuntos Económicos y Comerciales  
Embajada de los Estados Unidos de América

Final Blvd. Santa Elena  
Antiguo Cuscatlán  
El Salvador

Tel.: 278-4444  
Fax: 298-2336

INTERNET: [chris.lynch @ dos. us-state. gov](mailto:chris.lynch@dos.us-state.gov)

*Norma L. de Escobar*  
Subgerente General

**BANCO SALVADOREÑO**

Calle Rubén Darío No. 1236  
San Salvador, El Salvador, C.A.  
Apartado Postal No. (06)-73  
Código Postal 01-101 Telex: 2172 y 20382  
Tel. (503) 222-6504, Fax (503) 222-6245



**Banco Salvadoreño**

*Lic. Javier Mayora Re*  
ASISTENTE - DIVISAS  
GERENCIA INTERNACIONAL

Apartado Postal (06)73  
San Salvador, El Salvador, C.A.

Telex 20172 6 20382  
Tel.: (503) 221-3784  
Fax: (503) 222-8232

## EL SALVADOR FOOD IMPORTERS LIST

### ALIMENTOS PIZZA HUTT

Blvd. Y Condominio Los Héroes,  
3er. Nivel, San Salvador,  
El Salvador  
ATENCION: Lic. Francisco Rovira

Tel.: (503) 225-0666  
Fax: (503) 225-1489

### ARROCERA SAN FRANCISCO

Calle El Progreso y 37 Avenida Sur #2022  
Colonia Flor Blanca  
San Salvador, El Salvador  
ATENCION: Ing. Guillermo Novoa

Tel.: (503) 298-1737 / 298-1747  
Fax: (503) 223-9149

### BON APPETTTT, S.A. de C.V.

Km. 3 ½ Carretera a San Marcos,  
Col. Las Delicias, Calle Principal #1,  
(Frente a Fábrica Brooklyn)  
San Salvador, El Salvador  
ATENCION: Sr. Phillip Hand

Tel.: (503) 338-4066  
Fax: (503) 338-4101

### CARDIST'S ICE CREAM & DELY SHOP

Av. Masferrer #134  
San Salvador  
ATENCION: Sra. Diana de Simán

Tel.: (503) 279-1545  
Fax: (503) 279-2268

### COMERSAL, S.A. de C.V.

Km. 10 Carretera al Pto. de La Libertad  
Santa Tecla, La Libertad  
El Salvador  
ATENCION: Sr. Nicolás Salume, h.

Tel.: (503) 278-1111  
Fax: (503) 224-1515

### CODIPA, S.A.

Km. 5-1/2 Blvd. del Ejército Nacional  
San Salvador, El Salvador  
ATENCION: Sr. José Alberto Díaz

Tel.: (503) 227-4555 / 227-2300  
Fax.: (503) 227-2129

### C. IMBERTON, S.A. de C.V.

Km. 11 Carretera al Pto. de La Libertad  
Santa Tecla, La Libertad  
ATENCION: Lic. Carlos Imberton Deneke

Tel.: (503) 228-5666  
Fax.: (503) 228-3237

### D'CASA

Km. 10-4 Carretera al Pto. de La Libertad  
Santa Tecla, La Libertad  
El Salvador  
ATENCION: Sr. Carlos E. Araujo

Tel.: (503) 278-3300  
Fax.: (503) 278-3364

### DIADEMA, S.A. de C.V.

Ave. Olimpica #2008  
San Salvador  
ATENCION: Sr. Arturo Muyschondt P.

Tel.: (503) 223-2747  
Fax.: (503) 270-1281/223-2747

**DIPRISA, S.A. de C.V.**

Blvd. del Hipódromo y Avenida La Revolución

Colonia Escalón, San Salvador

EL Salvador

ATENCION: Sr. Rubén Rochi

Tel.: (503) 298-1233 / 279-1477

Fax.: ((503) 298-2853

**DINTASA, S.A. de C.V.**

Km. 9.5 Carretera al Pto. de La Libertad

Santa Tecla, La Libertad

El Salvador

ATENCION: Lic. Guillermo Valiente

Tel.: (503) 278-8744

Fax.: (503) 278-1355

**DISTRIBUIDORA DE FRUTAS, S.A.**

Calle Gerardo Barrios y

15 Av. Sur #448

San Salvador, El Salvador

ATENCION: Sr. José Antonio Escobar

Tel.: (503) 222-0641

Fax.: (503) 271-4687

**DISTRIBUIDORA NACIONAL, S.A.**

Final 45 Av. Sur #915

San Salvador,

El Salvador

ATENCION: Lic. Luis F. Henríquez

Tel.: (503) 289-1111

Fax.: (503) 289-0363

**DISTRIBUIDORA INCOCA**

Final Colonia Luz y Autopista Sur

San Salvador,

El Salvador

ATENCION: Sr. Nelson Mauricio Elías

Tel.: (503) 273-0544

Fax.: (503) 273-1252

**DISTRIBUIDORA NASSER, S. A.**

Final 8a. Avenida Nte. #135

San Salvador,

El Salvador

ATENCION: Sr. Jacobo Nasser

Tel.: (503) 225-8140

Fax.: (503) 225-2240/ 225-4951

**DISTRIBUIDORA ZABLAH, S.A.**

Km. 10 Carret. al Puerto de La Libertad

Santa Tecla

El Salvador

ATENCION: Lic. Alfonso Zablah

Tel.: (503) 228-1144

Fax.: (503) 228-4723

**DISTRIBUIDORA SEÑOR TENEDOR**

Alameda Dr. Manuel Enrique Araujo #3543

Plaza Jardín

San Salvador

ATENCION: Sra. Laurie de Novoa

Tel.: ( 503) 298-1870 / 298-1871

Fax.: (503) 279-4423

**DIZAC, S.A. de C.V.**

Urbanización Industrial Plan de la Laguna

Calle Circunvalación #15-B, Antiguo Cuscatlán

La Libertad, El Salvador

ATENCION: Sr. Edgar Zacarias B.

Tel.: (503) 243-1131 / 243-1448 / 243-1478

Fax.: (503) 243-0976



**DELICIA, S.A. de C.V.**  
Calle Gerardo Barrios y 21 Av. Sur  
San Salvador  
El Salvador  
ATENCION: Sr. Romeo Papini, h.

Tel.: (503) 222-7722 / 222-7966 / 271-6114  
Fax.: (503) 222-0434

**EMPRESAS LACTEAS FOREMOST, S.A.**  
Blvd. Venezuela #2354  
San Salvador  
El Salvador  
ATENCION: Sr. Carlos Merazzo Pinto

Tel.: (503) 223-9144  
Fax.: (503) 223-9300

**EMBOTELLADORA LA CASCADA**  
27 Calle Oriente #229  
San Salvador  
El Salvador  
ATENCION: Lic. Carlos Zelaya

Tel.: (503) 226-6122  
Fax.: (503) 225-0141

**INDUSTRIAS CRISTAL DE CENTROAMERICA**  
Avenida Independencia #545  
San Salvador,  
El Salvador  
ATENCION: Ing. Alberto Golcher

Tel.: (503) 222-6560 / 222-7566  
Fax.: (503) 221-2226

**EMBUTIDOS ROYAL, S.A.**  
Km. 2.5 Carretera a Los Planes de Renderos  
San Salvador  
El Salvador  
ATENCION: Sr. Eduardo Escobar

Tel.: (503) 270-7111  
Fax.: (503) 270-1078

**EMBUTIDOS DE EL SALVADOR**  
Calle Circunvalación  
Block "A" #17 - Plan de La Laguna  
Antiguo Cuscatlán, Depto. La Libertad  
ATENCION: Sr. Mario Cáceres

Tel.: (503) 298-5265  
Fax.: (503) 224-5757

**LIEBES, S.A. de C. V. / EXPORTADORA LIEBES, S. A.**  
de C.V.  
Ave. Miramundo y Calle Tacuba,  
Block "B", No. 27, Bosques de Sta. Elena,  
Antiguo Cuscatlán, El Salvador  
ATENCION: Lic. Oscar Rivas

Tel.: (503) 289-2100  
Fax.: (503) 289-2111

**ESSO AUTO MARKET**  
Km. 9.5 Carretera al Pto. de La Libertad  
San Tecla, La Libertad  
El Salvador  
ATENCION: Sr. Jorge Alberto del Cid

Tel.: (503) 278-0477  
Fax.: (503) 278-0535

**FABRICA MOLINERA, S.A.**  
Urbanización Industrial La Laguna  
Antiguo Cuscatlán, Depto. La Libertad  
El Salvador  
ATENCION: Sr. Heriberto Reyes

Tel.: (503) 243-0222/ 243-2015  
Fax.: (503) 243-2017

**FRUTALETAS, S.A. de C.V.**  
Blvd. Venezuela #2230  
San Salvador  
ATENCION: Ing. Jorge Hasbún

Tel.: (503) 279-3670  
Fax.: (503) 245-3333

**H. DE SOLA, S.A. de C.V**  
Blvd. Constitución #339  
San Salvador,  
El Salvador  
ATENCION: Ing. Eric Schleusz

Tel.: (503) 222-5888  
Fax.: (503) 298-6399

**HELADERA CENTRAL, S.A. - Helados Rich**  
Calle Modelo #508  
San Salvador  
ATENCION: Lic. Roberto Fernández

Tel.: (503)  
Fax.: (503)

**LA INDIANA, S.A.**  
Km. 11.5 Carretera Troncal del Norte  
San Salvador  
El Salvador  
ATENCION: Lic. Alejandro Mayer

Tel.: (503) 236-0171 / 236-1219  
Fax.: (503) 236-1754

**HELADOS RIO SOTO**  
1a. Calle Ote. #1008  
San Salador  
ATENCION: Sra . Gloria R. de Esmahan

Tel.: (503) 221-4011  
Fax.: (503) 222-8572

**PROCESOS LACTEOS, S. A. de C. V.**  
(HELADOS POP'S)  
Blvd. de Los Héroes - Psje. San Carlos #164  
San Salvador  
ATENCION: Sr. José A. Arroyo

Tel.: (503) 226-4433  
Fax.: (503) 226-0008

**INDUSTRIAL DE ALIMENTOS, S.A.**  
Complejo Industrial San Jorge  
Calle Antigua a San Antonio Abad #9  
San Salvador, El Salvador  
ATENCION: Lic. Arturo Muyshondt

Tel.: (503) 274-7444 / 274-7433  
Fax.: (503) 274-7455

**INDUSTRIAS MANA, S.A. de C.V.**  
Final Calle "C" - Quinta Las Mercedes  
Bodega #1 - Colonia San Joaquín Pte.  
San Salvador. El Salvador

Tel.: (503) 276-0871

**INDUSTRIAS LYA, S.A.**

2do. Pasaje #4

Colonia Regalado - Mejicanos

San Salvador, El Salvador

ATENCION: Lic. Juan Karl Trigueros

Tel.: (503) 226-1709

Fax.: (503) 226-2312

**EL DORADO, S.A. (INDUST. UNISOLA, S.A.)**

Blvd. del Ejército Nacional

Km. 3-5, Soyapango

El Salvador

ATENCION: Sr. Jerry Smith

Tel.: (503) 271-1122

Fax.: (503) 271-1299

**JAMS - JAMONES Y EMBUTIDOS  
(GRANJA EL FARO)**

Km. 2.5 Carretera a Planes de Renderos

San Salvador, El Salvador

ATENCION: Ing. Eduardo Escobar

Tel.: (503) 270-7111

Fax.: (503) 270-1078

**LA CONSTANCIA, S.A.**

Avenida Independencia #526

San Salvador,

El Salvador

ATENCION: Sr. Pompilio Retana

Tel.: (503) 271-0733

Fax.: (503) 281-4067

**LIZA, S.A. de C.V.**

6a. Calle Oriente #1-6

Nueva San Salvador, Depto. La Libertad

El Salvador

ATENCION: Ing. José Alberto Samayoa

Tel.: (503) 228- 2044

Fax.: (503) 228-1508

**MOORE COMERCIAL, S.A.**

29 Av. Sur #818

Colonia Cucumacayán

San Salvador, El Salvador

ATENCION: Ing. Carlos Enrique Pineda Nieto

Tel.: (503) 271-1200

Fax.: (503) 223-5988

**McCORMICK DE CENTROAMERICA**

Calle Principal y Av. Las Palmeras

Antiguo Cuscatlán - Depto. de La Libertad

El Salvador

ATENCION: Lic. Arduino Bianchi

Tel.: (503) 298-5977

Fax.: (503) 224-3446

**NEGOCIOS INTERNACIONALES, S.A.**

27 Avenida Sur #124

San Salvador

El Salvador

ATENCION: Ing. Gerardo Daura S.

Tel.: (503) 222-6666 / 222-6400

Fax.: (503) 771-2650

**PASBINC**

Calle L-3 #6

Ciudad Merliot - Antiguo Cuscatlán

Nueva San Salvador

Tel.: (503) 278-5322 / 278-5966



**PRODUCTOS NESTLE, S.A.**

Km. 11 - Carretera al Pto. de La Libertad

Santa Tecla - Depto. de La Libertad

El Salvador

ATENCION: Ing. Rodolfo López Celis

Tel.: (503) 228-4943 / 228-0557

Fax.: (503) 228-1049

**PRODUCTOS ALIMENTICIOS DIANA**

12 Av. Sur - Soyapango

San Salvador

El Salvador

ATENCION: Sr. Ricardo Paredes R.

Tel.: (503) 227-1322 / 227-1788

Fax.: (503) 227-2234

**PRODUCTOS ALIMENTICIOS IDEAL**

Urbanización Industrial - Plan de La Laguna

Antiguo Cuscatlán - Depto. de La Libertad

El Salvador

ATENCION: Sr. René Fuentes

Tel.: (503) 243-0222 / 243-2014 / 243-2015

Fax.: (503) 243-2017

**PRODUCTOS ALIMENTIC. SELLO DE ORO**

Final 49 Av. Sur

Colonia Luz - Plantel El Granjero

San Salvador, El Salvador

ATENCION: Ing. Agustín Martínez

Tel.: (503) 273-0100 / 273-0107

Fax.: (503) 273-0276

**NESTLE EL SALVADOR - FABRICA ILOPANGO**

Km. 11, Carretera Panamericana

Ilopango, San Salvador, El Salvador

ATENCION: Sr. Hugo Nájera

Tel.: (503) 295-0606

Fax.: (503) 295-0771

**PRODUCTOS MALHER, S.A.**

Carretera Panamericana, Km. 11-1/2

Ilopango, El Salvador

ATENCION: Sr. Jorge Maynor González

Tel.: (503) 295-0624 / 295-1100

Fax.: (503) 295-1784

**QUALITY FOODS DE C. A.**

Calle El Progreso #2022 y

37 Ave. Sur, Col. Flor Blanca

San Salvador - El Salvador

ATENCION: Sr. Ricardo Quiñonez Avila

Tel.: (503) 338-5492 / 338-5499

Fax.: (503) 338-5498

**ROBERTONI, S.A. de C.V.**

33 Calle Ote. #326,

Col. La Rábida, San Salvador

El Salvador

ATENCION: Sr. Roberto Cader

Tel.: (503) 225-8447 / 225-8386

Fax.: (503) 225 - 74440

**SABORES COSCO DE EL SALVADOR**

Km. 10 ½ Carretera a La Libertad

La Libertad, San Salvador

El Salvador

ATENCION: Ing. Ricardo Gutiérrez

Tel.: (503) 228-9902 / 270-7500

Fax.: (503) 288-9379

**SISTEMAS COMESTIBLES, S.A.**

(Cadena Mr. Donut)

63 Avenida #125

Contiguo Mr. Donut La Campana

San Salvador, El Salvador

ATENCION: Sr. Nicolas Salume, P.

Tel.: (503) 278-5511

Fax.: (503) 224-1515

**SUMMA INDUSTRIAL, S.A.**

Km. 10-1/4 - Carretera al Pto. de La Libertad

Santa Tecla - Depto. de La Libertad

El Salvador

ATENCION: Sr. Carlos Enrique Araujo

Tel.: (503) 278-3300

Fax.: (503) 278-3364

**START MART (INVERSIONES TEXACO)**

Carretera a Santa Tecla Km. 10.5

Frente a Maya Country Club

Santa Tecla, El Salvador

ATENCION: Sr. Arnoldo Quirós

Tel.: (503) 278-8888

Fax.: (503) 278-3279

**UNION DISTRIBUIDORA, S.A.**

Urb. y Blvd. Santa Elena, entre Calle Cerro Verde

Pte. y Calle Conchagua, Antiguo Cuscatlán

El Salvador

ATENCION: Lic. Rodrigo Zablah S.

Tel.: (503) 278-4400

Fax.: (503) 278-6262

**DISTRIBUIDORA EUROPEA**

Calle Chaparrastique No. 28,

Parque Industrial Santa Elena

Antiguo Cuscatlan, La Libertad

ATENCION: Lic. Roberto S. Samour

Tel.: (503) 278-7000

Fax.: (503) 278-1989

**DAISE**

7a. Calle Poniente #5008

Col. Escalón, San Salvador

ATENCION: Sr. Roberto A. Díaz

**MULTI-MART**

Calle Siemens #52,

Santa Elena, Antiguo Cuscatlán,

Pegado a Taller Quijano

ATENCION: Sr. Ricardo Castro

Tel.: (503) 278-7257

Fax.: (503) 278-7257

**CORPORACION SAROSI INTERNACIONAL**

Blvd. Bayer L-37 C, Ciudad Merliot,

Santa Tecla.

ATENCION: Sr. Conrado Rovira

Ing. Miguel Treminio

Tel.: (503) 278-1234

Fax.: (503) 278-1423

**DICOFA**

Plan de La Laguna

Calle Antiguo Cuscatlán

Polígono "C", El Salvador

Tel.: (503) 243-0188

Fax.: (503) 243-1188

**STEINER, S. A.**

Carretera a Santa Tecla, Km. 9 1/2,  
San Salvador.

ATENCION: Sr. Gerardo Steiner

Tel.: (503) 278-2331 / 278-0185

Fax.: (503) 278-2012

**COLOSA, S. A. de C. V.**

Lote No. 5, Polígono C, Pje. B,  
Urb. Industrial La Laguna, Antiguo Cuscatlán,  
La Libertad. El Salvador

ATENCION: Lic. Ricardo Lazo

Tel.: (503) 243-0188 . 243-1201

Fax.: (503) 243-1198

**ALESA**

Calle Los Planes de Renderos  
Km. 2 1/2, Continuo a Urb. Alfa y Pollos Royal,  
Quinta La Escondida, Finca Los Tres Monos,  
San Salvador, El Salvador

ATENCION: Ing. Carlos Leret

Tel.: 270-1083

Fax: 270-5666

**SAVONA**

Final Calle Principal, Col. Las Rosas #2,  
San Salvador, El Salvador

ATENCION: Sr. Max Catani

Tel. / Fax: 278-8040

**EL BURRITO REPRESENTACIONES**

Calle Báltico #23, Col. Jardines de Guadalupe,  
San Salvador, El Salvador.

ATENCION: Sr. Marco Antonio Romo

Tel.: 243-2232

Fax: 243-2242

**ALIMENTOS CONGELADOS, S. A. de C. V.**

Calle Circunvalación Pje. 2 No. 1025,  
Col. Campestre, San Salvador

ATENCION: Sr. Mauricio Rivas

Tel.: 223-1354

Fax.: 224-4380

**DISTRIBUIDORA PRODEINSA, DE C. V.**

Calle Circunvalación No. 9,  
Plan de La Laguna, La Libertad,  
El Salvador

ATENCION: Ing. Jorge Ernesto Murga

Tel.: 243-1118

Fax: 243-1052

**DISESCO, S. A. DE C. V.**

5a. Calle Poniente y 7a. Ave. Norte  
#428, San Salvador, El Salvador.

ATENCION: Ing. Armando Santamaría

Tel.: 271-4044

Tel: 271-3952



## SUPERMARKETS

### **SUPERMERCADOS AMERICA, S.A.**

Calle Gerardo Barrios #1511

San Salvador

El Salvador

ATENCION: Lic. Milton Melara

Tel.: (503) 221-0337 / 222-0043

Fax.: (503) 221-3882

### **SUPERMERCADOS LA DESPENSA DE DON JUAN, S.A.**

Calle El Progreso #3320 - San Salvador

El Salvador, C.A.

ATENCION: Lic. Edgardo Hasbún

Tel.: (503) 245-1700

Fax.: (503) 224-6987

### **SUPERMERCADOS SELECTOS**

Avenida Olímpica y 59 Av. Sur

San Salvador

El Salvador

ATENCION: Sr. Francisco Calleja

Tel.: (503) 223-3860 / 245-2244

Fax.: (503) 223-3288

### **SUPERTIENDAS LA TAPACHULTECA**

Km. 9 ½ Carretera al Puerto de La Libertad,  
La Libertad

El Salvador Srita. Maritza Vásquez

ATENCION: Lic. Moisés Torres

Tel.: (503) 278-0533 / 278-1200

Fax.: (503) 278-1241

### **SUPERMERCADOS EL SOL**

75 Av. Sur y 7a. Avenida Nte. #470

Colonia Escalón, San Salvador, El Salv.

Of. Centro: Centro Comercial Arce,

Calle Arce #470, San Salvador, El Salv.

ATENCION: Ing. Guillermo Saca

Tel.: (503) 298-3051 / 298-3052

Fax.: 298-3572

Tel.: (503) 222-8310 / 271-2173

Fax.: (503) 222-8206

### **SUPERMERCADOS EUROPA, S.A.**

Calle Arce y 5a. Av. Nte.

San Salvador

El Salvador

ATENCION: Lic. Jaime Saca

Tel.: (503) 222-4425 / 222-4100

Fax.: (503) 222-4425

### **SUPERMERK, S.A.**

Boulevard El Hipódromo

Centro Comercial San Benito #16

San Salvador

ATENCION: Sr. Orlando Menéndez

Tel.: (503) 279-0812 / 279-0816

Fax.: 279-0812

### **COOPERATIVA DE LA FUERZA ARMADA DE EL SALVADOR - COOPEFA**

Colonia General Arce, Ave. Caballería y

Calle Soldado Desconocido, San Salvador,

El Salvador.

## **SALVADORAN ASSOCIATIONS**

### **ASOCIACION NACIONAL DE LA EMPRESA**

#### **PRIVADA (ANEP)**

71 Av. Nte. #204

Colonia Escalón , San Salvador

ATENCION: Ing. Roberto Vilanova

### **ASOCIACION SALVADOREÑA DE INDUSTRIALES (ASI)**

Calle Roma y Liverpool

San Salvador, El Salvador

ATENCION: Sr. Leonel Mejía

### **ASOCIACION DE DISTRIBUIDORES DE EL SALVADOR (ADES)**

Condominio Plaza Suiza - 3a. Plta.

Local LC-5 - San Salvador, El Salvador

ATENCION: Sr. José A. González Ginner

### **ASOCIACION DE PROVEEDORES AGRICOLAS (APA)**

47 Av. Nte. Condominio Metro 2000

Loc. "C-23 - Entre 1a. C. Pte. y Juan P. II

San Salvador,

ATENCION: Lic. Alfredo Cardoza

### **CAMARA DE COMERCIO E INDUSTRIA DE EL SALVADOR**

9a. Av. Nte. y 5a. Calle Pte.

San Salvador, El Salvador

ATENCION: Lic. Ricardo Simán

### **CAMARA AMERICANA DE COMERCIO (AMCHAM)**

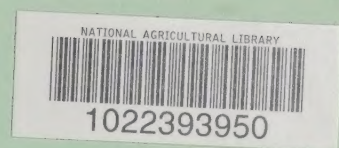
87 Avenida Norte. #720

Apartamento "A" - San Salvador

ATENCION: Lic. Carlos Iraheta







*Q*

